MEDIVATORS®

# ADVANTAGE PLUS® Pass-Thru

Automated Endoscope Reprocessor

# User Manual

Endoscope Disinfection System

MEDIVATORS
A Cantel Medical Company

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50098-704 REV D, ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor

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# CHAPTER 1

## INTRODUCTION

This chapter describes the MEDIVATORS® ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor.

## Using This Manual

This manual describes the features of the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor, including the hardware, software, setup, operation, safety, maintenance, and troubleshooting procedures. It is important to follow the instructions provided to keep the ADVANTAGE PLUS Pass-Thru Reprocessor in proper operating order and to ensure that endoscopes receive adequate disinfection.
This is not a service manual and does not provide detailed instructions for service beyond general maintenance. See the Service Manual for servicing instructions. Contact your service representative for additional service information.

## ADVANTAGE PLUS Pass-Thru Reprocessor Features

The ADVANTAGE PLUS Pass-Thru Reprocessor was designed for ease of use and maintenance in the disinfection of endoscopes. Features include:

- Pass thru design.
- Individual channel flow, connectivity and blockage monitoring.
- Automated endoscope leak test
- Single use disinfectant: fresh disinfectant solution for each endoscope.
- Asynchronous operation of dual reprocessing basins with transparent glass doors.
- A dedicated computer for system operation of reprocessing cycle, cycle recording, powerful quality assurance reporting, easy backups, networking availability, and remote diagnostics
- Computer protected by built in UPS.
- Hookup blocks and parameter sets dedicated to a family of endoscopes ensure correct channel monitoring, pressures and flow rates to meet manufacturers' specifications.
- Automated alcohol flush.
- Automated detergent flush.

## Intended Use

The ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor is intended for the high level disinfection of endoscopes and endoscope accessories.

The ADVANTAGE PLUS Pass-Thru Reprocessor has been validated by Medivator for use only with RAPICIDE® PA High-Level Disinfectants and INTERCEPT® PLUS Detergent.
Indications for Use of the ADVANTAGE PLUS® Pass-Thru Reprocessor:

The ADVANTAGE PLUS Pass-Thru Endoscope Reprocessing System tests, washes, disinfects and rinses endoscopes, such as fiber optic and video endoscopes between patient uses. The ADVANTAGE PLUS Pass-Thru Reprocessor is indicated to provide high level disinfection of heat sensitive semi-critical endoscopes and related accessories.

The ADVANTAGE PLUS Pass-Thru Endoscope Reprocessing System uses RAPICIDE PA High Level Disinfectant to provide high level disinfection of endoscopes when used according to the directions for use.

The system uses INTERCEPT PLUS Detergent in its wash cycle.

RAPICIDE PA Test Strips are used at the end of each disinfection cycle to ensure that the used disinfectant is at or above the minimum recommended concentration (MRC) of 850 ppm peracetic acid; this ensures that the disinfectant was above MRC during the entire disinfection cycle.

RAPICIDE PA should be used in the ADVANTAGE PLUS Pass-Thru Reprocessor under the following contact conditions:

| | |
|---|---|
| Contact Time: | 5 minutes |
| Temperature: | 20°C |
| MRC: ` | 850 ppm |

## Regulatory Compliance

The ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor complies with ISO 15883-1 and 15883-4.

The ADVANTAGE PLUS Pass-Thru Reprocessor complies with IEC 61326 Electromagnetic Compatibility (EMC) Standards.

The reprocessor is ETL and cETL certified and listed for safety per IEC Standard IEC 61010-1 and IEC 61010-2-40, UL, Standard UL 61010-1 and Canadian Standard CAN/CSA-C22.2 No. 61010-1 for laboratory equipment.

## Notes, Cautions, and Warnings

Throughout the manual are notes, service notes, cautions, and warnings. These provide important information and you should pay special attention to them. Examples are shown below.

**Note:** A note refers to important information to which you should pay special attention.

**Service:** A service note refers to operations or repairs that only a trained service technician may perform.

**Caution** A caution describes actions or conditions that may cause damage to or destruction of the equipment.

**WARNING A warning describes actions and conditions that may cause severe personal injury or death to the operator or patient**.

## Operator Safety

- Equipment must be operated solely by qualified personnel, and used for its intended use only. Never use the reprocessor for any purpose other than the manufacturer's specific intended purpose.

**WARNING To avoid biological contamination and chemical burns; always wear appropriate personal protective equipment (PPE) when handling endoscopes or disinfectant solutions.**

- Washing and disinfectant solutions must be used according to the regulations governing their use, safety, and shelf life.
- Do not attempt to open the reprocessor door during operation.
- For peracetic acid (PAA) disinfectant handling guidelines contact the disinfectant manufacturer.
- In case of eye contact, skin contact or inhalation, please refer to the detergent and disinfectant manufacturer's guidelines for first aid.
- In the event of a disinfectant or other chemical leak, use personal protective equipment (clothing, glove & safety glasses) & follow the disinfectant manufacturer's guidelines for spill clean-up procedures.
- Place guidelines for disinfectant clean-up in an easily visible area near the reprocessor to ensure users will have access to the information when needed.
- It is recommended that the facility conduct regular training of all personnel concerned with the operation and maintenance of this equipment, including emergency procedures for toxic, flammable or pathogenic material released into the environment. Records of attendance at training should be maintained and evidence of understanding demonstrated.

## Handling and storage of 70% Isopropyl Alcohol.

- **Handling**
  Avoid prolonged or repeated contact with skin. Extinguish any naked flames. Remove ignition sources. Avoid sparks. Do not smoke. Take precautionary measures against static discharges. Earth all equipment. Do not empty into drains.

- **Handling Temperatures**
  Ambient.

- **Storage**
  Keep away from direct sunlight and other sources of heat or ignition. Do not smoke in storage areas. Keep container tightly closed and in a well-ventilated place.

- **Storage Temperatures**
  Ambient.

- **Product Transfer**
  Take precautionary measures against static discharges. Earth all equipment. Avoid splash filling.

- **Respiratory Protection**
  No specific measures

- **Eye Protection**
  Goggles or face shield.

- **Body Protection**
  Standard issue work clothes. Safety shoes or boots, chemical resistant.

## Installation and Maintenance

Proper maintenance ensures effective disinfection and prolongs the life of the reprocessor.

- ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor must be grounded in accordance with applicable regulations.
- The reprocessor should not be placed on surfaces which could cause a fire or fume hazard.
- The system default is factory-set for the specific disinfectant immersion time for RAPICIDE® PA High-Level Disinfectants.
- All pressure regulators are factory-preset. Do not adjust the settings. Contact your Technical Support representative for assistance.
- MEDIVATOR endoscope hookups are not autoclavable. The hookups are automatically disinfected with each use due to their exposure to the entire disinfection cycle; no further disinfection or rinsing is required prior to their next use.
- Do not remove covers, doors, or panels fastened with screws while the reprocessor is in use.
- Replacement parts must be ordered from the manufacturer to maintain the warranty.
- Do not block ventilation openings.
- Regularly check all cables, tubing, and drains for damage or leaks.
- Do not carry out any maintenance that is not described in this manual.
- Ensure that the power connection is accessible in the event that emergency disconnection is necessary.
- Prior to undertaking any service or maintenance operations or when resetting the RCD or GFI, ensure that the ADVANTAGE PLUS Pass-Thru Reprocessor is disconnected from the main power supply.
- If service or maintenance operations are to be conducted on the water system, ensure that the ADVANTAGE PLUS Pass-Thru Reprocessor is isolated from the main water supply.
- Yearly preventive maintenance required, contact Medivators for details.

For service or service-related questions, contact Medivators Technical Support or your local Medivators Distributor.

## Guidelines for Reliable Disinfection

### Water Quality

Potable water is the minimum standard.  Medivators recommends the use of a high quality water pre filtration system that filters incoming water to 1 micron.

- The high performance 0.2 micron (absolute rated) water filters included with the reprocessor are highly effective at removing microorganisms and particles larger than 0.2 microns. Appropriate pre-filtration and regular disinfection are required to maintain the performance of this filter.
- The routine maintenance schedule recommends replacing the 0.2 micron water filter every six months or sooner, depending on the pre-filtration system and the quality of the incoming water. If the filter clogs to the point of non-effectiveness, the reprocessor will alarm and will not continue until the filter is replaced.
- To meet the ISO 15883-4 water quality standards the water line disinfection must be performed weekly.

### Disinfectant Solution

Use only with RAPICIDE® PA High Level Disinfectant (Part A & Part B).

### Detergent Solution

INTERCEPT® PLUS Detergent must be used in the washing phase of the reprocessing cycle. INTERCEPT PLUS Detergent is formulated to use with medical instruments.

### Monitoring Disinfectant Potency

The efficacy of a disinfection procedure is directly related to the disinfectant solution used, and the amount of time the endoscope is exposed to that solution.

- RAPICIDE PA High-Level Disinfectants must be monitored for potency every reprocessing cycle according to the instructions in this manual.
- Use the RAPICIDE PA Test Strips to test the potency of the solution. If the potency of the solution is below MRC minimum recommended concentration (MRC), discard and replace it with fresh solution.
- Never use disinfectant with unacceptable potency levels.

## Endoscope Washing and Leak Testing

The ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor may be used with all makes and sizes of flexible, immersible endoscopes that can be internally and externally disinfected. Proper endoscope disinfection is required because endoscopes have multiple internal channels that have the potential to harbor microorganisms that could cross-contaminate patients. Reprocessing quality depends largely on a thorough pre-cleaning of all endoscope channels, valves and fittings where contamination can occur.

This reprocessor includes a washing cycle. Soiled endoscopes must be pre-cleaned according to manufacturer's guidelines and your internal facility procedures before reprocessing. Follow the endoscope manufacturer's instructions and established professional guidelines while pre-cleaning and disinfecting endoscopes.

Leak test all endoscopes prior to placement in the ADVANTAGE PLUS Pass-Thru Automated Endoscope Reprocessor.

## Professional Guidelines

The following organizations have published recommended guidelines for cleaning and disinfecting endoscopes.

**Society of Gastroenterology Nurses and Associates**
330 N. Wabash Ave., Suite 2000
Chicago, IL 60611-7621
USA
Tel: 800-245-7462
www.sgna.org

**American Society for Gastrointestinal Endoscopy**
3300 Woodcreek Dr.
Downers Grove, IL 60515
USA
Tel: 866-353-2743
www.asge.org

**British Society of Gastroenterology**
3 St Andrews Place,
Regent's Park,
London NW1 4LB
ENGLAND
Tel: (+44) (0)20 7935 3150
www.bsg.org.uk

**Association for Professionals in Infection Control and Epidemiology**
1275 K St, NW, Suite 1000
Washington, DC 20005
USA
Tel: 1-800-650-9570
www.apic.org

**Canadian Society of Gastroenterology Nurses and Associates**
#224, 1540 Cornwall Road
Oakville, ON L6J 7W5
CANADA
www.csgna.com

**Société Française d'Hygiène Hospitalière**
Hôpital de la Croix-Rousse
Unité d'Hygiène Hospitalière-Épidémiologie
93 Grande Rue de la Croix-Rousse
69317 Lyon Cdx04
FRANCE
Tél: 04 72 07 19 83
www.sf2h.net

**Gastroenterological Society of Australia**
PO Box 508
Mulgrave 3170
Victoria
Australia
Tel: +61 3 9001 0279
www.gesa.org.au

## Warning Summary

**WARNING** Portable and mobile communication devices can affect electrically-operated medical equipment

**WARNING** Connecting a chemical container with the incorrect fluid may cause the endoscope to be improperly disinfected. Do not use the endoscope on a patient if this occurs.

**WARNING** Wear personal protective equipment (PPE) (clothing, mask, gloves & eye wear).

**WARNING** All endoscope hookups must be periodically inspected for wear. Discard and replace damaged hookups otherwise it could result in an endoscope that is not disinfected and therefore should not be used on a patient.

**WARNING** Verify all connections to the endoscope are secure and tubing is not linked. Failure to do so could result in an endoscope which is not disinfected and therefore should not be used on a patient.

**WARNING** Verify the connection tubing does not interfere with the spray head and confirm that the spray function is working during the cycle. Failure to do this could result in an endoscope that is not disinfected and therefore should not be used on a patient.

**WARNING** Before removing the endoscope, verify all connections to the endoscope are secure. If an adapter is loose or disconnected, the disinfection was not complete and must be repeated. Failure to do so could result in an endoscope which is not disinfected and therefore should not be used on a patient.

**WARNING** Report all system errors to your supervisor.

**WARNING** Wear clean gloves to prevent soiling of the disinfected endoscope.

**WARNING** If a run error was generated, a channel is blocked, or the endoscope is leaking, the endoscope must not be released for patient use. If there is any doubt as to whether an endoscope is correctly disinfected, it must be disinfected again before use. Contact your supervisor for further instructions.

**WARNING** Verify all endoscope connections are secure. Failure to do so could result in an endoscope which is not disinfected and therefore should not be used on a patient.

**WARNING** Avoid possible chemical burns. Wear personal protective equipment (clothing, mask, gloves & eye wear).

**WARNING** Use only disinfectant and detergent approved by Medivators Inc.

**WARNING** Check the expiration date of the disinfectant in the reprocessor each day.

**WARNING** Never use disinfectant beyond the manufacturer's expiration date, even if the MRC level is acceptable.

**WARNING** Never use disinfectant that tests below the acceptable MRC level, even if it has not yet reached the expiration date.

**WARNING** If the MRC test fails the endoscope has not been disinfectant and should not be used on a patient.

**WARNING** When replacing disinfectant, wear personal protective equipment (clothing, mask, gloves & eye wear). The disinfectant and detergent manufacturers may recommend additional protection.

**WARNING** If leaking liquid is present and you suspect it is disinfectant read and follow the disinfectant instructions before attempting a cleanup.

**WARNING** Never use the equipment in a manner inconsistent with the manufacturer's guidelines. Using the equipment in a manner inconsistent with the manufacturer's guidelines may impair the protections that are designed into the device and may cause injury to the user.

**WARNING** The basin doors are made of tempered glass. In the unlikely event of breakage, please do not use the endoscope in the basin and contact Medivators Technical Service.

**WARNING** In the event of both the dirty and clean doors being open on a single basin, remove the endoscope from the dirty side and reprocess again before use. Please contact Medivators Technical Service.

## Reprocessor Label Symbols

Below are descriptions of the various symbols used throughout the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor.

Wear proper PPE

Acid Present

High Voltage Present

Use Caution

Refer to the User Manual

Date of Manufacture

Alternating Current

# CHAPTER 2

## SYSTEM OVERVIEW

This chapter is an overview of the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor.

# Main Components

## Exterior Components

The ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor consists of two independent reprocessing modules. Each has a basin, automatic dirty and clean side doors, and the necessary pumps and valves to wash, disinfect, rinse, and dry most models of flexible, submersible endoscopes.

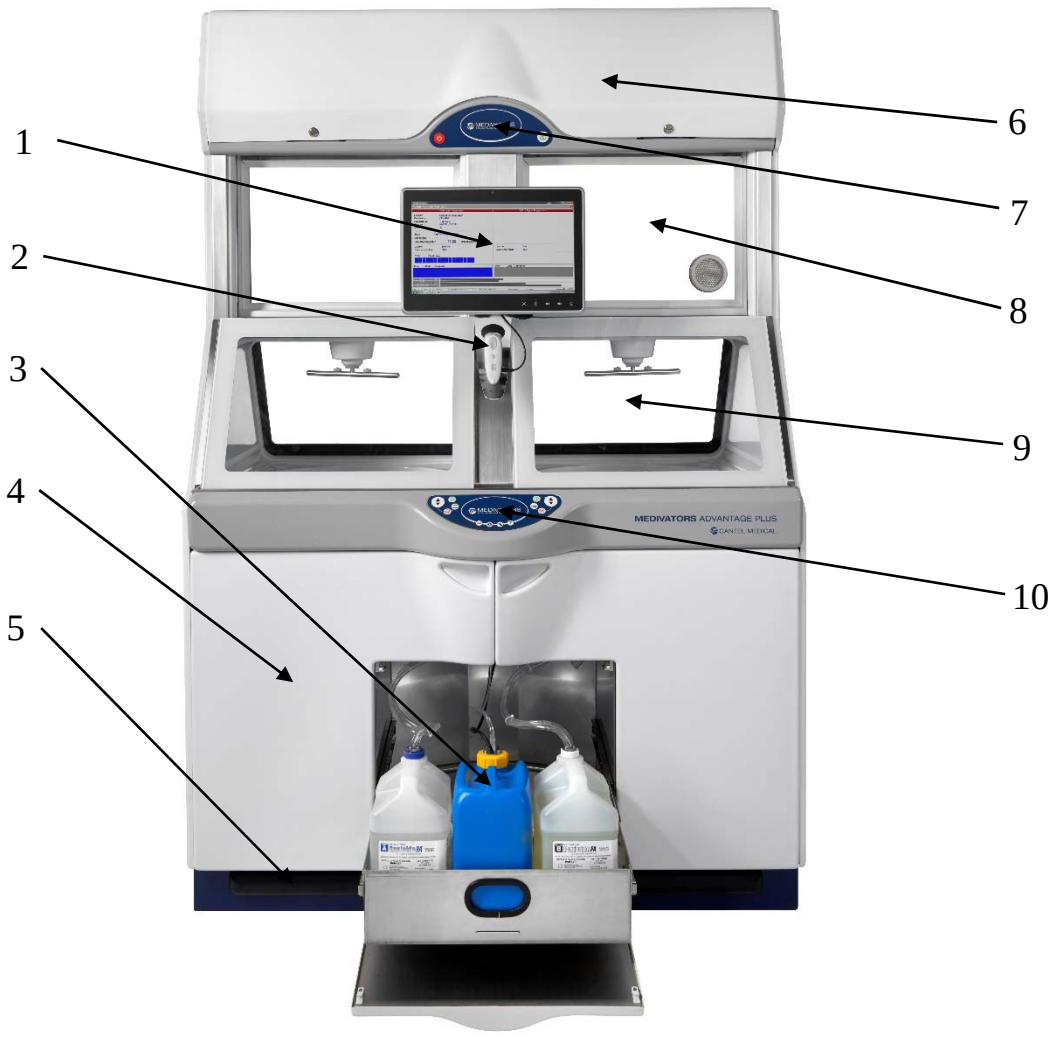



**Figure 1 Dirty Side Front View**

1. **Touchscreen Monitor:** Displays the reprocessor software, the touchscreen is used to control the software.
2. **Barcode Scanner:** Wireless barcode scanner used for entering operator, endoscope, hookup, chemistry lot number, doctor and patient ID information.
3. **Chemical Drawer:** Pullout drawer houses the disinfectant and detergent.
4. **Access Doors:** Doors open to allow access to the water filters, alcohol container and the sample ports.
5. **Foot Switch:** Allow hands free door opening and closing.
6. **Overhead Compartment:** Contains the computer, UPS, circuit breaker, facility connection (air, water, electrical, network, and ventilation). This compartment is only accessible from the dirty side.

7. **Overhead Control Panel:** Contains the main power switch and the computer power switch.
8. **Windows with Intercom:** Gives the ability to see as well as communicate with the clean side operators.
9. **Basin Doors:** The basin doors move up and down to give access to and enclose the basins.
10. **Control Panel:** Allows for the control of the reprocessor and its software.

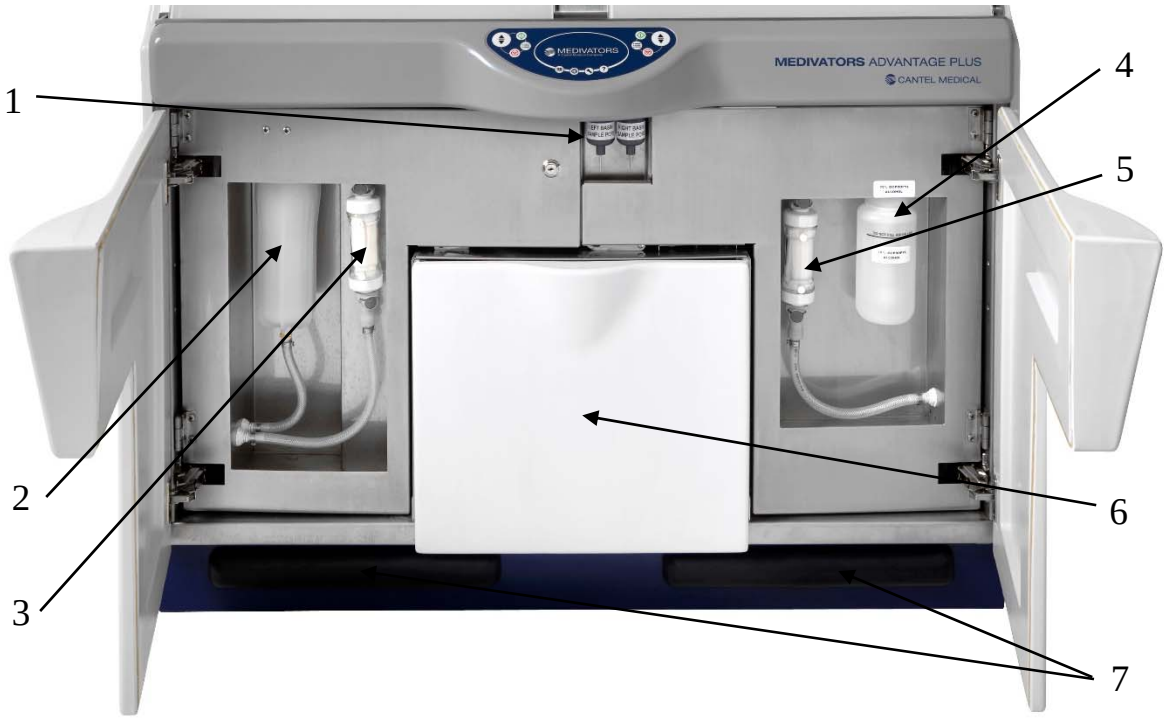



**Figure 2 Dirty Side Service Door View**

1. **Sample Ports:** Dispenses the disinfectant for MRC testing at the end of each cycle.
2. **0.4 Micron Water Filter:** Filters incoming water to 0.4 micron.
3. **Left Basin 0.2 Micron Point of Use Water Filter:** Bacteria-retentive water filter supplying water to the left basin.
4. **Alcohol Reservoir:** Holds alcohol that may be used in the alcohol/air purge process.
5. **Right Basin 0.2 Micron Point of Use Water Filter:** Bacteria-retentive water filter supplying water to the right basin.
6. **Chemical Drawer:** Pullout drawer houses the disinfectant and detergent
7. **Foot Switches:** The foot switches allow hands free door opening and closing.

**Figure 3 Left Basin, Dirty Side View**

1. **Spray Arm:** Provides fluid spray for washing, disinfection and rinsing of exterior surfaces of endoscopes and basin.
2. **Overflow Drain:** Prevents basin from overfilling with fluid.
3. **Connection Manifold:** Point of attachment for the endoscope hookup.
4. **Spray Head:** Provides fluid spray for washing, disinfection and rinsing of exterior surfaces of endoscopes and basin.
5. **Drain:** Outlet for draining fluid from the basin.
6. **Detergent Inlet:** Point of injection for the detergent fluid when used.
7. **Fluid Inlet:** Point of entry for water and disinfection.
8. **Sample Port Overflow:** Overflow port for the sample port.
9. **Minimum Basin Level Sensor:** Fluid sensor to ensure proper filling and draining of the basin.
10. **Basin Lights:** LED lights provide illumination of the basin area.

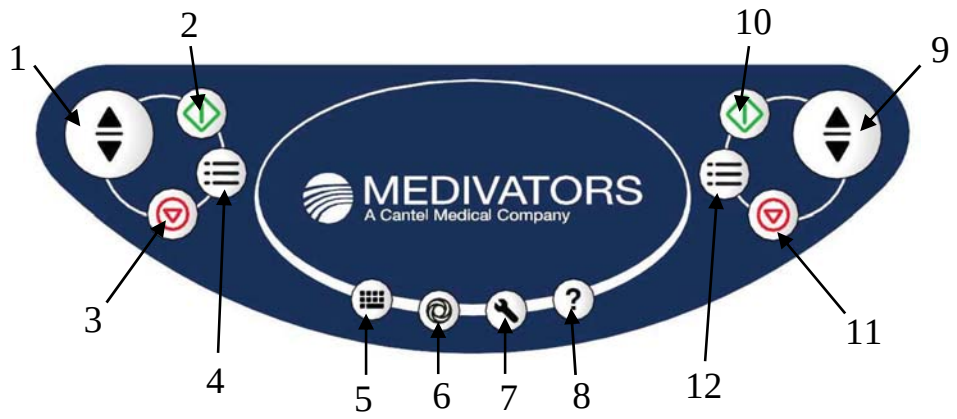



**Figure 4 Dirty Side Control Panel**

1. **Left Door Open/Close:** Button used for open and closing the left dirty side door.
2. **Left Basin Start:** Button used for starting a cycle or acknowledging MRC test pass on left basin.
3. **Left Basin Cancel:** Button used for canceling a cycle or acknowledging MRC test fail on left basin.
4. **Left Basin Menu:** Button used for launching menu system in LIO on left basin.
5. **Onscreen Keyboard:** Button used for launching onscreen keyboard.
6. **ENDORA:** Button used for launching ENDORA if installed (optional).
7. **Service Screen:** Button used for displaying input/output screen in LIO for both basins.
8. **Help:** Button used to launch help screen.
9. **Right Door Open/Close:** Button used for open and closing the right dirty side door.
10. **Right Basin Start:** Button used for starting a cycle or acknowledging MRC test pass on right basin.
11. **Right Basin Cancel:** Button used for canceling a cycle or acknowledging MRC test fail on right basin.
12. **Right Basin Menu:** Button used for launching menu system in LIO on right basin.

**Figure 5 Dirty Side Overhead Panel**

1. **Main Power** (Emergency Shutdown)**:** Press monetarily to power up the reprocessor, not including the computer. Press and hold for 3 seconds to power down the reprocessor, not including the computer. Button is lit when reprocessor is powered.
2. **Computer Power:** Press momentarily to power up the computer. Press momentarily to power down the computer. Button is lit when the computer is powered.

**Figure 6 Clean Side Front View**

1. **Clean Side Displays:** Displays cycle information.
2. **Windows with Intercom:** Gives the ability to see as well as communicate with the dirty side.
3. **RFID Target:** Used for scanning operator RFID tag.
4. **Overhead Control Panel:** Contains the main power switch.
5. **Basin Doors:** The basin doors move up and down to give access to and enclose the basins.
6. **Barcode Scanner:** Used for scanning operator barcode.
7. **Foot Switches:** The foot switches allow hands free door opening and closing.

**Figure 7 Clean Side Overhead Panel**

1. **Main Power** (Emergency Shutdown)**:** Press monetarily to power up the reprocessor, not including the computer. Press and hold for 3 seconds to power down the reprocessor, not including the computer. Button is lit when reprocessor is powered.

### Hookup Blocks

The endoscope channels are connected to the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor channel manifold via a hookup block. Each endoscope model requires a unique hookup block to ensure that proper disinfection can be achieved. Refer to the MEDIVATORS Hookup Lookup guide on the Medivators website (www. medivators.com/hookuplookup/) to identify the correct hookup block to use for the endoscope to be reprocessed.

**Note:** Before a new type of endoscope is reprocessed or if you have any questions about a connection block, contact your Medivators representative.

### Accessories

Endoscope accessories, buttons and valves may be disinfected in ADVANTAGE PLUS Pass-Thru Reprocessor. Use the provided mesh bag.

### Barcode Scanner

The barcode scanner can be used to automatically enter data rather than manually entering it with the control panel, touchscreen or keyboard. The barcode scanner can be used to enter the following information:

- Operator
- Endoscope
- Hookup
- Chemistry lot numbers

- Doctor (optional)
- Assistant (optional)
- Patient number (optional)

The barcode scanner is wireless and needs to stay with the reprocessor it has been paired with. Identifying labels on the barcode scanner and the barcode scanner bracket will ensure the scanner stays with the proper reprocessor.

**Note:** It is important to charge the barcode scanner every night. The barcode scanner bracket includes a charging cable.

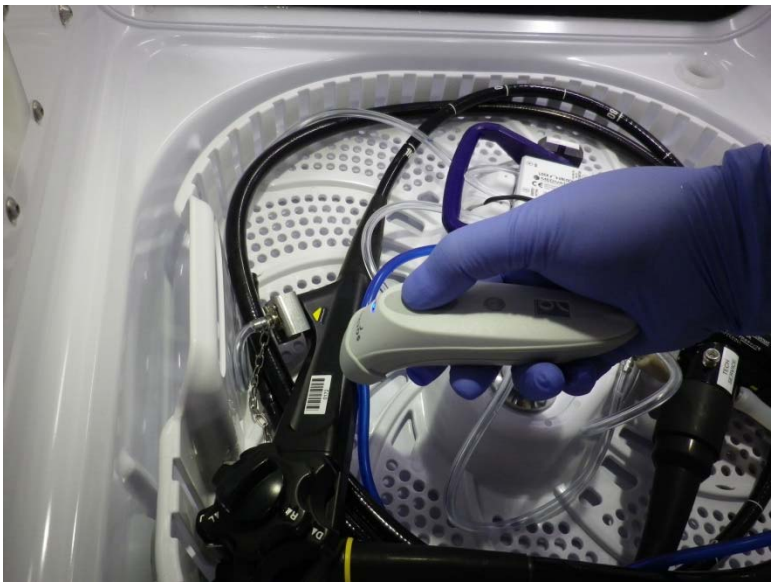


**Figure 8 Barcode Scanner Scanning Endoscope Barcode**

## Advantage Software

There are five software applications associated with the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor:

1. **LIO** (Logic Input/Output) is the main software program that operators use to perform and run an endoscope cycle. This part of the software controls the ADVANTAGE PLUS Pass-Thru Reprocessor and is what runs and displays on the monitor. This program is used by daily operators of the reprocessor.
2. **Management** is the software program for managing endoscopes, users and cycle information. It allows access to input data, process reports, and can manage multiple ADVANTAGE PLUS Pass-Thru Reprocessor reprocessors.
3. **PrintService** automatically prints a certificate to the cycle log printer which is dedicated to each reprocessor. The certificate contains system information and reprocessing cycle details pertaining to a specific reprocessing cycle.
4. **Services** is an application that runs in the background which allows Print Service to communicate with LIO. For automatic printing to occur both Print Service and Services need to be running.
5. **Language** allows for the selection of the language in which LIO and Management will be displayed in.

Before using the Advantage software, you should have a working knowledge of computers and the Windows operating system. If you are uncertain how to proceed, contact your supervisor for assistance.

1. Verify the computer is on and Windows is running.
2. Find the ADVANTAGE PLUS Pass-Thru Automated Endoscope Reprocessor folder titled **ADV** on the Windows desktop and double click on it.
3. Double click on the desired application icon to start the program.

At computer startup LIO, PrintService and Services will automatically start.

**Figure 9 ADVANTAGE System Folder on the Desktop**

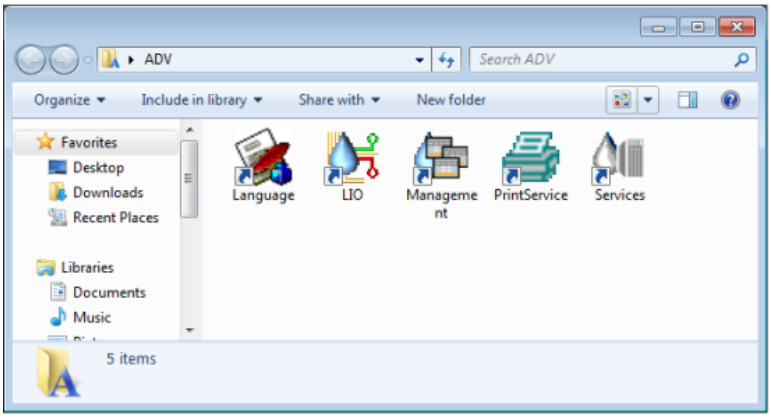



**Figure 10 ADVANTAGE System Applications**

## LIO

LIO is the main software program that operators use to perform and run an endoscope cycle. This part of the software controls the MEDIVATORS® ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor and is what runs and displays on the monitor. This program is used by daily operators of the reprocessor.

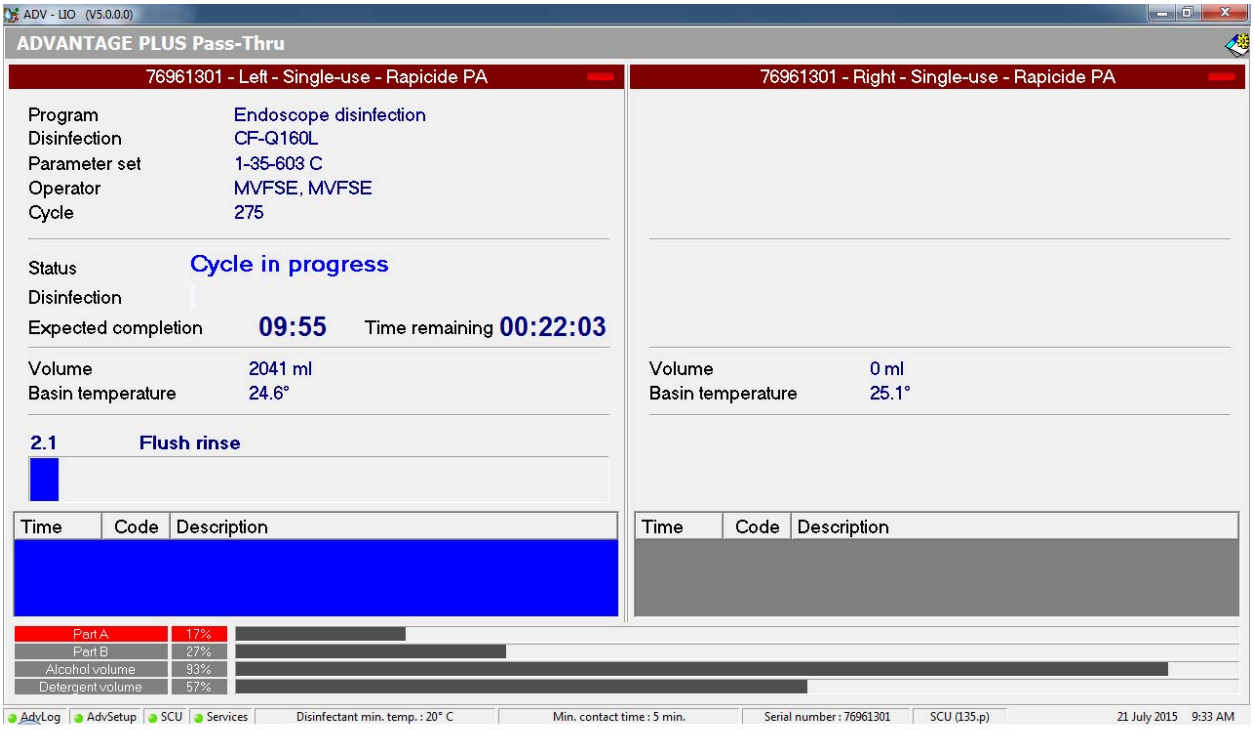



**Figure 11 LIO Screen**

### Basin and Program Status

The status of each basin is indicated in the main section of the screen. Program information for the left basin is on the left side of the screen; information for the right basin is on the right side of the screen.

The information provided includes:

- Operator name
- Endoscope serial number
- Program type
- Parameter set
- Cycle number
- Program status

- Expected completion time
- Run time remaining
- Volume
- Temperature
- Program progress bar
- Cycle messages
- Fluid reservoir status

**Program Messages**

Program messages and operator instructions are shown in the lower section of the screen. The messages are presented with text and color. If an error occurs, an audible alarm may also sound.

The text shows the time at which the message occurred, the message code, and a description of the message or instructions for the operator to follow. For troubleshooting purposes, the message codes and additional message details are listed in Chapter 5 Troubleshooting. The meaning of each screen color is shown in Table 1:

**Table 1 Screen Color and Program Status**

| | Screen Color | Program Status |
|---|---|---|
| **1** | Gray | Program in standby |
| **2** | Orange | Idle, with door open or a warning is present |
| **3** | Blue | Cycle in process |
| **4** | Red | Error or Cycle Failed, endoscope not disinfected |
| **5** | Green | Cycle completed successfully, endoscope disinfected |
| **6** | Purple | Wash-only cycle completed successfully, endoscope not disinfected. |

**Table 2 Cycle Status**

| Status | Description |
|---|---|
| ACTIVE | The program is progressing correctly. |
| CORRECT | The endoscope was disinfected without any faults or program |
| CORRECT!!! | The endoscope was disinfected with errors reported. |
| STOP (fault) | The program is stopped due to an error. |
| STOP (SCU) | The safety control program stopped the program. |
| STOP (OPERATOR) | The operator stopped the program without a fault report |
| STOP (LIO) | The program stopped automatically after an error report or the maximum error time (50 minutes) was reached. |
| SHUTDOWN (fault) | After an error, the endoscope is rinsed so that it can be safely |
| SHUTDOWN (OPERATOR) | The operator stopped the program. Run down program. |
| SHUTDOWN (SCU) | The safety control program stopped the disinfection. |
| SCU (REJECT) | The safety control program rejected the disinfection. Open the door to close the program. |
| LIO (REJECT) | Disinfection was rejected due to an automatic program stop. |

**Table 3 Endoscope Status**

| Status | Description |
|---|---|
| Disinfected | The endoscope was run through a complete disinfection cycle. |
| Not disinfected | The endoscope was not disinfected due to a disinfection cycle |
| Disinfected but not patient safe | The endoscope was disinfected but failed the leak test. The endoscope cannot be used on a patient. |
| Not applicable | The program is not an endoscope disinfection program. Warning: The endoscope can be used only if the connectors are correctly connected after the program. |

### Fluid Reservoir Status

The estimated percentage of disinfectant Part A and Part B, alcohol and detergent remaining in the reservoirs is provided at the bottom of the screen.

## Management

Management is the software application for managing endoscopes, users and cycle information. It allows access to input data, process reports, and has the ability to manage multiple ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessors.

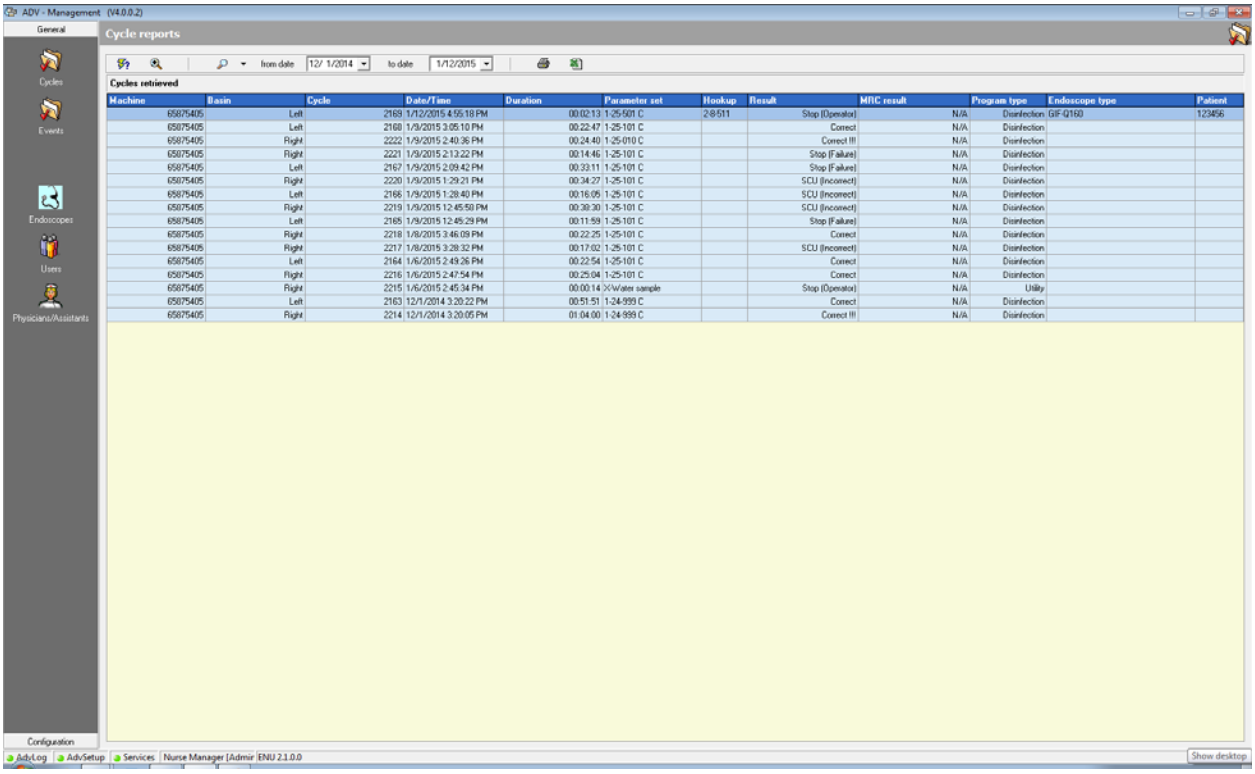

ADV - Management (V4.0.0.2)
General
Cycles
Events
Endoscopes
Users
Physicians/Assistants
Configuration
Cycle reports
from date 12/ 1/2014
to date 1/12/2015
Cycles retrieved
Machine Basin Cycle Date/Time Duration Parameter set Hookup Result MTC result Program type Endoscope type Patient
65875405 Left 2169 1/12/2015 4:55:18 PM 00:02:13 1-25-501 C 2-8-511 Stop (Operator) N/A Disinfection GIF-Q160 123456
65875405 Left 2168 1/9/2015 3:05:10 PM 00:22:47 1-25-101 C Correct N/A Disinfection
65875405 Right 2222 1/9/2015 2:40:36 PM 00:24:40 1-25-010 C Correct !!! N/A Disinfection
65875405 Right 2221 1/9/2015 2:13:22 PM 00:14:46 1-25-101 C Stop (Failure) N/A Disinfection
65875405 Left 2167 1/9/2015 2:09:42 PM 00:33:11 1-25-101 C Stop (Failure) N/A Disinfection
65875405 Right 2220 1/9/2015 1:29:21 PM 00:34:27 1-25-101 C SCU (Incorrect) N/A Disinfection
65875405 Left 2166 1/9/2015 1:28:40 PM 00:16:05 1-25-101 C SCU (Incorrect) N/A Disinfection
65875405 Right 2219 1/9/2015 12:45:50 PM 00:39:30 1-25-101 C SCU (Incorrect) N/A Disinfection
65875405 Left 2165 1/9/2015 12:45:29 PM 00:11:59 1-25-101 C Stop (Failure) N/A Disinfection
65875405 Right 2218 1/8/2015 3:46:09 PM 00:22:25 1-25-101 C Correct N/A Disinfection
65875405 Right 2217 1/8/2015 3:28:32 PM 00:17:02 1-25-101 C SCU (Incorrect) N/A Disinfection
65875405 Left 2164 1/6/2015 2:49:26 PM 00:22:54 1-25-101 C Correct N/A Disinfection
65875405 Right 2216 1/6/2015 2:47:54 PM 00:25:04 1-25-101 C Correct N/A Disinfection
65875405 Right 2215 1/6/2015 2:45:34 PM 00:00:14 W-Water sample Stop (Operator) N/A Utility
65875405 Left 2163 12/1/2014 3:20:22 PM 00:51:51 1-24-999 C Correct N/A Disinfection
65875405 Right 2214 12/1/2014 3:20:05 PM 01:04:00 1-24-999 C Correct !!! N/A Disinfection
AdvLog
AdvSetup
Services
Nurse Manager [Admin ENU 2.1.0.0
Show desktop

**Figure 12 Management**

Refer to Chapter 7 for more detailed instructions on the use of the software applications.

## Clean Side Display Scheme

System Idle

Cycle in Progress

Successful Cycle Completion

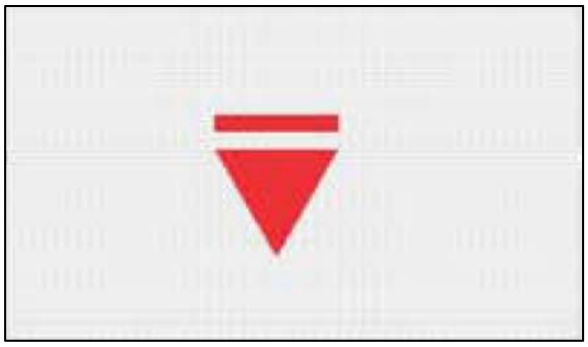
Operator Login

Operator Login Failure

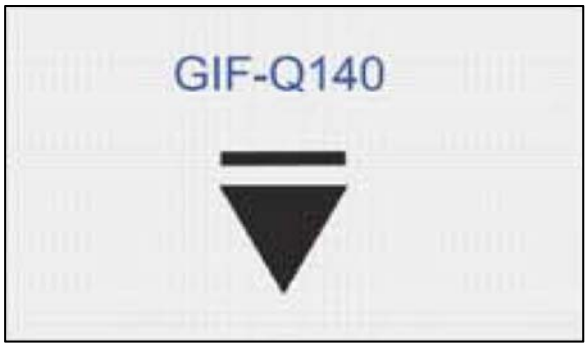
Cycle Failure

Cycle Shutdown

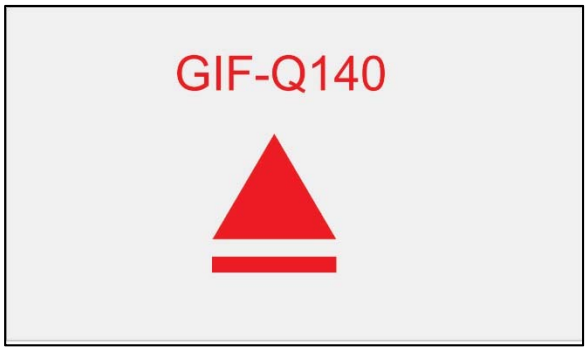
Failed Cycle Completion



Close Door Error




Close Door




Open Door Error

# CHAPTER 3

## OPERATION

This chapter explains how to prepare and disinfect an endoscope in the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor.

# System Startup

Before reprocessing endoscopes in the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor ensure the reprocessor is operational by verify the following:

- The computer and main power are on.
  - To power up the reprocessor press the main power and computer power buttons located on the overhead control panel.
- The incoming water and air are turned on.
  - The incoming water and air valves are located behind access panels in the wall above the reprocessor.
- The water and air filters are in place.
  - Refer to the Maintenance Chapter for filter locations and installation.
- The chemistry is loaded.
  - Refer to the Chemistries and Utilities chapter for directions for loading chemistry.
- The LIO application is running.

# Prepare the Endoscope

## Place the Endoscope in the Basin

Endoscopes fit best in the reprocessor if they are installed in a particular fashion. The final position of the endoscope in the basin depends primarily on the type of endoscope. To a lesser extent, the brand of endoscope may also affect the final position in the basin. Do not forcibly bend the endoscope to get it to fit. When positioned properly, the endoscope will fit appropriately in the basin.

1. Open the dirty side door using either the foot switch or the control panel button to gain access to the basin.
2. If a cassette is being used, place the cassette in the basin.
3. Hold the control head in your left hand and the insertion tube and light guide in your right hand.
4. Place the control head in the basin with the angulation controls facing up.

**Figure 13 Endoscope Placement in the Basin**

5. Set the insertion tube in a clockwise circle in the basin.

**Figure 14 Endoscope Placement in the Basin with Cassette**

6. Fit the light guide tube in a counterclockwise circle in the basin.

## Install the hookup

1. Select the proper hookup for the scope.  Once the scope and hookup are loaded in the basin the software will confirm that the proper hookup has been selected.
2. Hold the hookup with the handle positioned to the right with the leak test tubing assembly (blue tube or blue washer) to the left.

**Figure 15 Connecting the Hookup to the Channel Manifold**

3. Place the hookup lightly over the manifold making sure that none of the hoses run or are pinched under the block.

**Figure 16 Press the Hookup onto the Connection manifold**

4. Lock the hookup in place by moving the handle to the left.

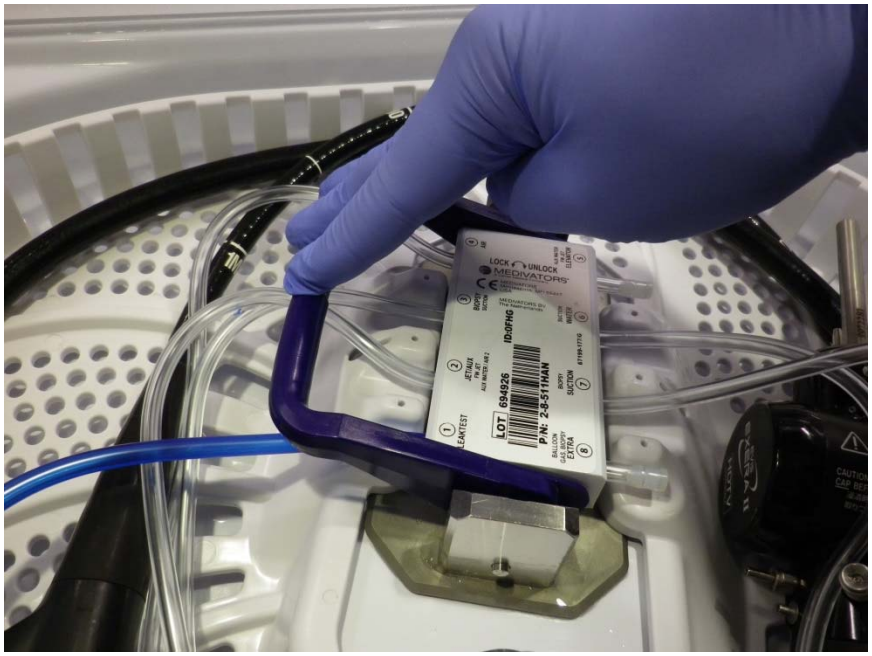


**Figure 17 Locking the Hookup in Place**

**WARNING Inspect the seating of the hookup to the manifold. Failure to achieve a proper connection could result in an endoscope that is not disinfected and therefore should not be used on a patient.**

## Connection of the Endoscope Channels

1. Connect the endoscope channel connections referencing the **Hookup Connection Guide** supplied with each hookup.

**WARNING All endoscope hookups must be periodically inspected for damage, and replaced if damaged, otherwise it could result in an endoscope that is not disinfected and therefore should not be used on a patient.**

**Figure 18 Connecting the Channels**

2. Make sure the connection hoses do not have any sharp bends or kinks.
3. Position the connection hoses in such a way that they will not be caught by the spray head.
4. Install the Channel Separator

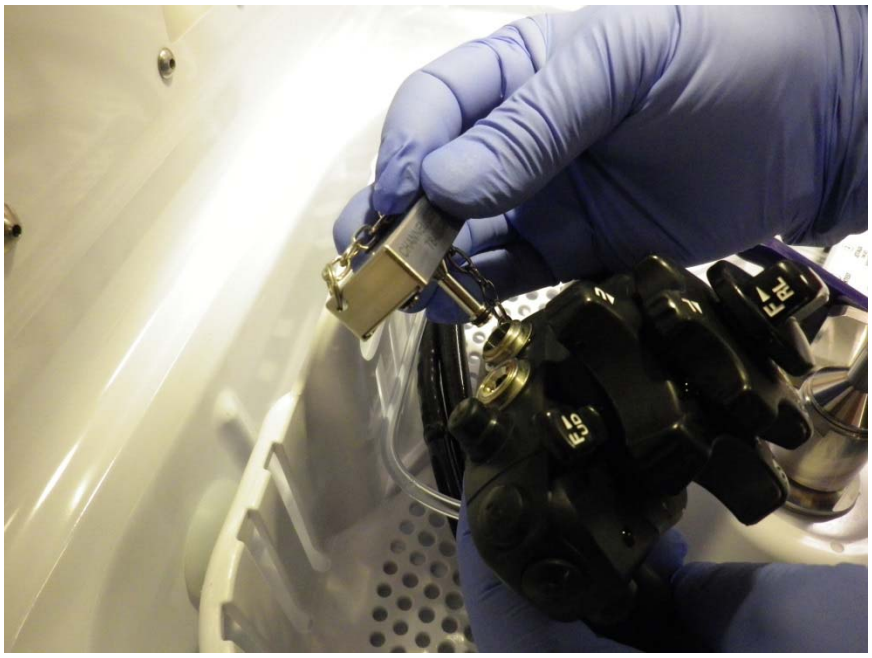


**Figure 19 Attaching the Channel Separator**

## Verify the Connections

**WARNING Verify all connections to the endoscope are secure. Failure to do so could result in an endoscope which is not disinfected and therefore should not be used on a patient.**

Before closing the basin door, inspect the hookup to ensure that all connections are made properly and the tubing does not interfere with the sprayer.

1. All hookup connections must be securely connected to the endoscope.
2. The channel separator must be installed.
3. The connector hoses must not be kinked.
4. Move any connector tubes away from the head of the sprayer so that it can turn freely.

**WARNING Verify the connection tubing does not interfere with the spray head and confirm that the spray function is working during the cycle. Failure to do this could result in an endoscope that is not disinfected and therefore should not be used on a patient.**

**Note** It is recommended to wipe down all exterior surfaces that come in contact with scope contamination using a mild detergent, multipurpose cleaner or disinfectant wipes in between cycles. This includes the barcode scanner and the touchscreen monitor.

**Figure 20 Spray Head must be Unobstructed**

# Disinfection Process Summary

The complete reprocessing cycle in the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor is comprised of a number of specific steps designed to ensure proper endoscope disinfection. These steps include: startup, leak test, washing, disinfect, rinse, alcohol, and air phases. All steps must be properly followed and should not be modified beyond manufacturer recommendations.

## Cycle Startup Phase

During the start-up phase, the software reads and monitors all system sensors. If an error is detected, a message is displayed and the process is halted. The system operator then needs to resolve the error before the cycle can be continued. Refer to Chapter 5: Troubleshooting for appropriate instructions to resolve errors.

## Leak Test Phase

The endoscope is pressurized and the pressure is monitored for a period of time. If the pressure drops below a set reading, an error message is displayed and the process is halted.

The leak test in the ADVANTAGE PLUS Pass-Thru Reprocessor is not a replacement for the primary leak test which should occur before the manual cleaning step. The reprocessor leak test is considered a secondary leak test with the purpose of protecting the endoscope from fluid invasion.

**WARNING If the reprocessor detects a leak in the endoscope, do NOT use the endoscope on patients**.

## Wash Phase (Optional)

During the wash phase, detergent and water enter the basin. This basin fluid is then flushed through the endoscope channels. At the completion of the phase, the basin is drained and the endoscope channels are flushed with fresh water. A rinse phase then follows to enable the wash phase select the appropriate parameter set.

**Note:** Disinfectant efficacy testing shows that without the wash phase high level disinfection can still be achieved because the endoscope is pre-rinsed in the reprocessor.

## Disinfectant Phase

During the disinfectant phase, the endoscope channels are flushed with disinfectant. The basin is filled with disinfectant solutions and the endoscope is soaked for the disinfectant contact time as recommended by the disinfectant manufacturer. After the soak, the disinfectant is drained from the basin.

### Rinse Phase

During the rinse phase, the basin is partially filled with water and then drained to eliminate disinfectant from inside the endoscope and from the basin. The basin is then filled with fresh water while the endoscope channels are being flushed. Once the basin fills up, water flushes through the endoscope channels. The basin is then drained while the channels are purged with fresh water.

### Air Purge Phase

The air phase is simply a programmed time during which air is purged through the endoscope channels. The air is used to aid in drying of the endoscope.

### Alcohol Purge Phase (Optional)

During the alcohol phase, alcohol is injected through the endoscope channels. The alcohol is used to help purge any residual fluids from the endoscope.

## Starting a Disinfection Cycle

Once the endoscope and hookup have been properly placed in the basin and connected, the reprocessing cycle may be started.

From the Dirty Side:

1. If the **Operator** Menu is present on the monitor scan the **Operator** barcode.
2. If the **Operator** Menu is not present, press the **Menu** button on the control panel and scan the **Operator** barcode.

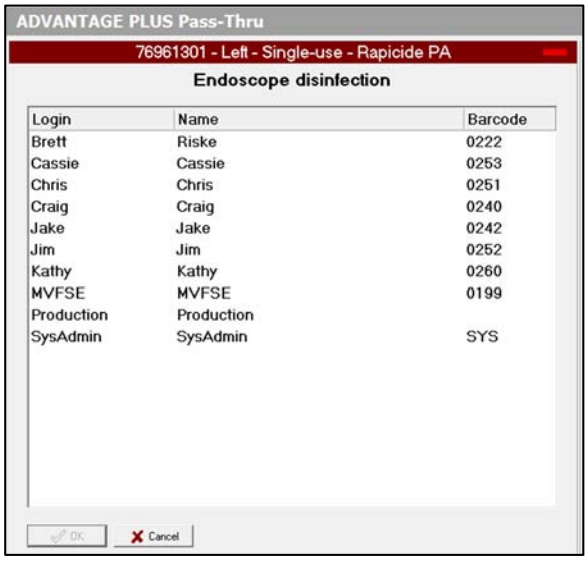



**Figure 21 The Operator Menu**

3. The **Endoscope** Menu will appear, scan the **Endoscope** barcode.

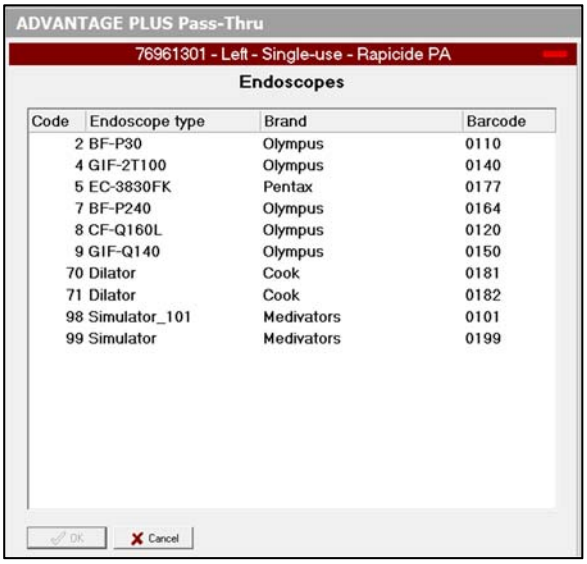



**Figure 22 Then Endoscope Menu**

4. The **Hookup** Menu will appear, scan the **Hookup** barcode.

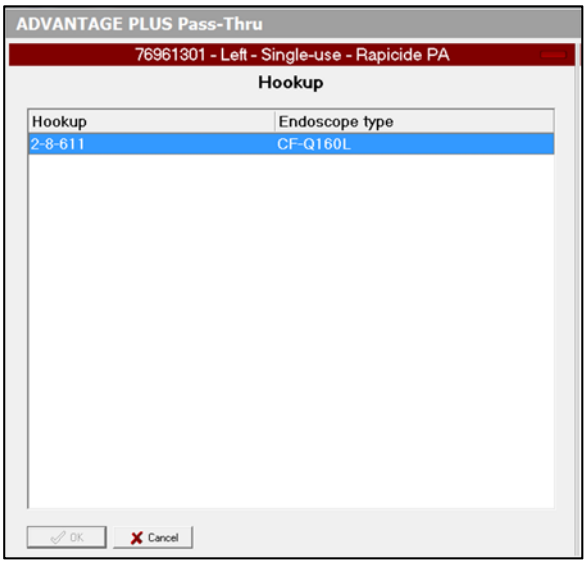



**Figure 23 The Hookup Menu**

5. If more than one parameter set is assigned to an endoscope the parameter sets will be displayed, select the desired parameter set using the touchscreen. If only one parameter set is assigned to an endoscope that parameter set will be automatically chosen.
6. If Patient, Physician or Assistant information is requested, enter the information using the barcode scanner or touchscreen.
7. The door will close automatically and the cycle will start.

**Note:** The patient code, physician code, and assistant code on your ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor are configurable. If your system administrator has determined that these items do not have to be tracked, the screens will not be shown.

## Disinfection Cycle Interruption

If the disinfection cycle is interrupted due to an error, the message window will turn red and the error message will be displayed. Consult Chapter 5, Troubleshooting to determine the cause of the issue and potential actions. If an error occurs perform the following:

1. Press the **Start** button on the control panel to see if the cycle will continue.
2. If the cycle continues to fail press the **Cancel** button on the control panel. The cancellation process will start and may take up to 15 minutes to complete.
3. Follow the Cycle Completion in case of Failure instructions in the next section.

**WARNING If system power is lost during a reprocessing cycle, the system will not complete the reprocessing cycle once the power is restored. The endoscope is not disinfected and should not be used on a patient. You must start the reprocessing cycle over so that the endoscope is properly disinfected.**

**WARNING Report all system errors to your supervisor.**

## Cycle Completion of a Successful Cycle: Clean Side

Once the cycle has completed successfully, indicated by the Successful Cycle Completion screen on the Clean Side display, the endoscope can be removed from the Clean Side.

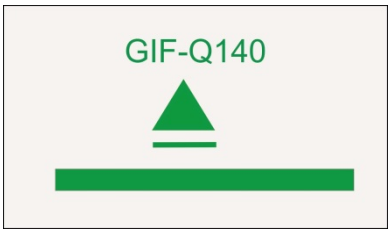



**Figure 24 Successful Cycle Completion**

1. Test disinfectant MRC from the dirty side, refer to **Testing Disinfectant MRC** in this chapter.
2. Press the **Footswitch** for the appropriate basin, the Operator Login screen will appear on the Clean Side display.
3. **Scan** the **Operator** barcode
4. The Clean Side door will open.
5. Verify all connections to the endoscope are secure.
6. Remove the endoscope and cassette (if used).
7. Once the endoscope has been removed, close the clean side door by pressing the **Footswitch**
8. The endoscope can now be used on a patient or placed in a drying cabinet for storage.

**WARNING Wear clean gloves to prevent soiling of the disinfected endoscope.**

**WARNING Before removing the endoscope, verify all connections to the endoscope are secure. If an adapter is loose or disconnected, the disinfection was not complete and must be repeated. Failure to do so could result in an endoscope which is not disinfected and therefore should not be used on a patient.**

## Cycle Completion of a Successful Cycle: Dirty Side (Optional)

Once the cycle has completed successfully, indicated by the cycle and endoscope status displayed in LIO, the endoscope can be removed from the Dirty Side.

**WARNING Removing a successfully disinfected scope from the Dirty Side may recontaminate the scope.**

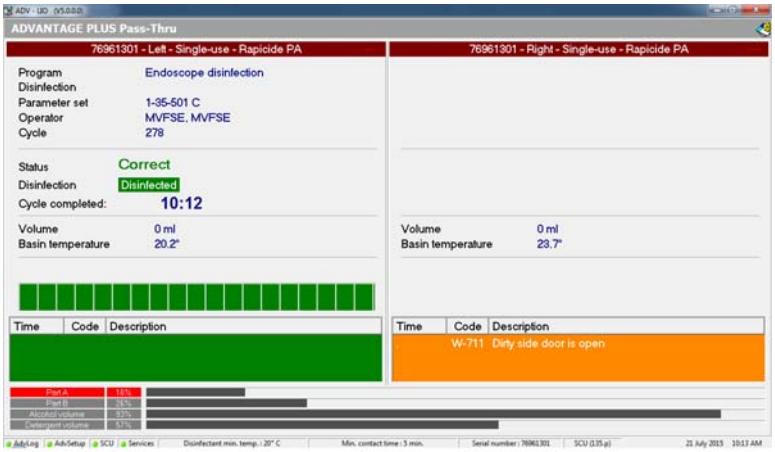



**Figure 25 Successful Cycle Completion in LIO**

1. Test disinfectant MRC from, refer to **Testing Disinfectant MRC** in this chapter.
2. Press the **Open/Close Door** button on the Dirty Side control panel or press the **Footswitch** for the appropriate basin.
3. A window will appear stating “Opening this door may contaminate the reprocessed endoscope. Proceed?”. Press **OK** on the touchscreen to proceed.
4. The **Operator** Menu will appear, scan the **Operator** barcode.
5. The Dirty Side Door will open.
6. Verify all connections to the endoscope are secure.
7. Remove the endoscope and cassette (if used).

## Cycle Completion of a Failed Cycle

If an error was generated, resulting in an endoscope not being disinfected, the endoscope must not be released for patient use. If there is any doubt as to whether an endoscope is correctly disinfected, it must be disinfected again before use. Contact your supervisor for further instructions.

Once a cycle completes for a failed cycle, the endoscope can only be removed from the Dirty Side.

1. Press the **Open/Close Door** button on the Dirty Side control panel or press the **Footswitch** for the appropriate basin.
2. The **Operator** Menu will appear, scan the **Operator** barcode.
3. The Dirty Side Door will open.
4. Fix the issue and rerun the endoscope or remove the endoscope.

## Delayed Start

When selecting a delayed start, the endoscope is placed in the basin but the disinfection cycle will not begin until a pre-determined time. This is an administrative function and is available only during the time period as setup by the system administrator.

1. Prepare and connect the endoscope as described in this chapter.
2. After scanning the **Operator** barcode at the **Operator** Menu, the **Start time** Menu opens. If the **Start time** Menu does not open, the delayed start features is not available.
3. Select **Delayed star**t and press the **OK** button on the touchscreen.

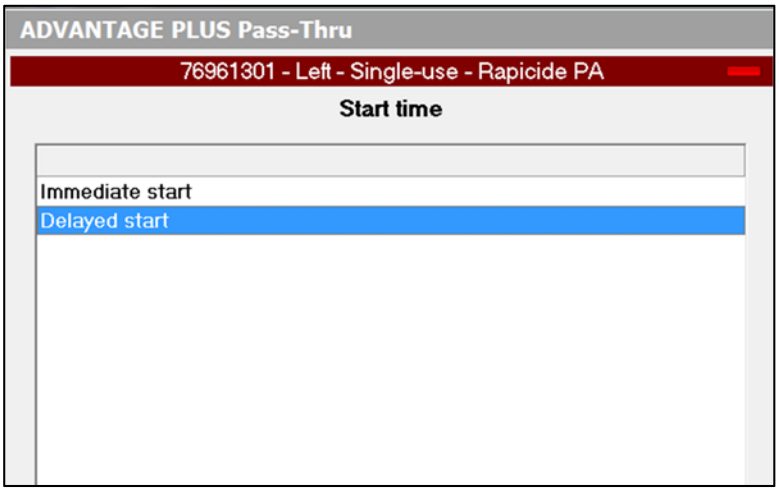



**Figure 26 Delayed Start Menu**

4. When the **Select Start time** Menu opens, scroll down to select the desired start time and date. Click the **OK** button on the touchscreen.

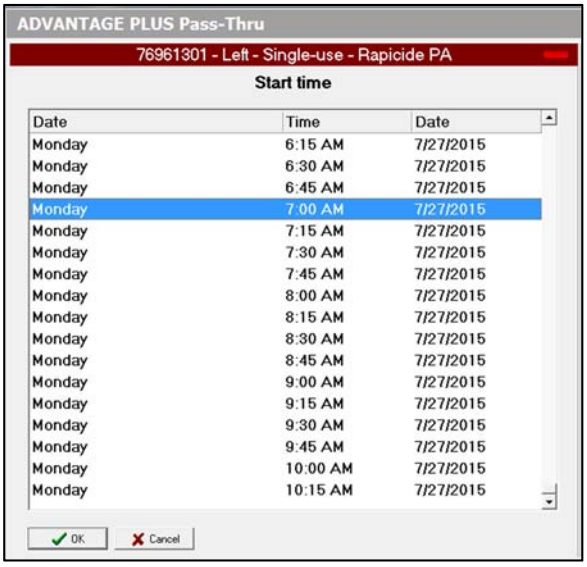



**Figure 27 Select Delayed Start Time**

5. The Delay Start program window opens. Verify that the data on the screen is correct, and then click the **Start** button on the control panel.
6. The disinfection cycle will start at the selected start time.

# Testing Disinfectant MRC

At the end of a cycle, a sample of the disinfectant can be gathered and the MRC (minimum recommended concentration) can be tested with the RAPICIDE PA Test Strip. Medivators recommends that the chemistry is tested at the end of every cycle.

**WARNING if the disinfectant MRC is not checked at the end of each cycle there is a risk that the endoscope was not disinfected.**

## Taking a Disinfectant Sample

At the end of a successful disinfectant cycle LIO will prompt the operator to collect a disinfectant sample from the sample port to check the MRC. The disinfectant sample is gathered from the Dirty Side.

1. Open the dirty side right access door to access the sample port.
2. Wearing protective gloves, take a sample of the disinfectant from the sample port by pressing a sample cup up against the metal prong.

**Figure 28 Taking a Disinfectant Sample**

3. Close the access door.
4. Test the sample using a RAPICIDE PA Test Strip to ensure that the disinfectant is above MRC.
5. If the MRC test passes, press the **Start** button on the Dirty Side control panel as prompted by LIO. Then endoscope can now be removed from the clean side.
6. If the MRC test fails, press the **Cancel** button on the Dirty Side control panel as prompted by LIO. The cycle will fail indicating the endoscope has not been disinfected.

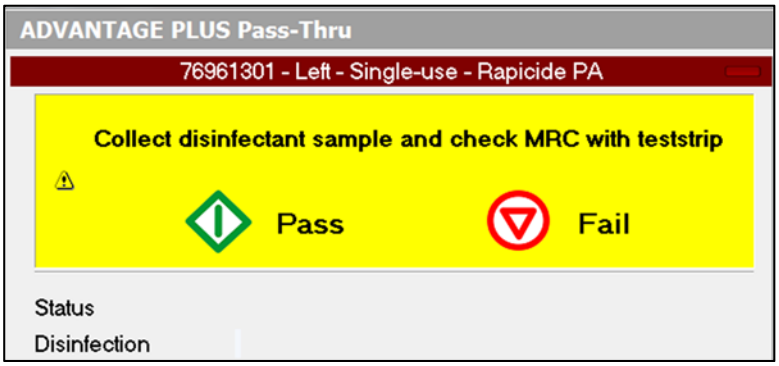



**Figure 29 LIO Prompt to Sample Disinfectant**

## If the Test Strip Fails

- If the test strips indicates a fail, rerun the cycle and retest.
- If the test strip indicates a fail again, open a new bottle of test strips and test the concentration again with a new test strip.
- If it continues to fail, contact Medivators Technical Support.

# Reports

## Run Data Recorded

For each disinfection program run, the following data is recorded and stored on the computer hard drive:

- Reprocessor serial number
- Basin
- Run number
- Date and time
- Hookup used
- Cycle result
- Disinfectant temperature
- Disinfectant contact time
- Program run
- Operator Load ID
- Operator Unload ID
- Endoscope model
- Endoscope serial number
- Patient ID (optional)
- Physician (optional)
- Assistant (optional)
- Process step times
- Errors
- Disinfectant MRC test results

## Printing Reports

If a printer is attached to the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor a cycle report can automatically at the end of the disinfection cycle.

### Previous Cycle Reports

All completed cycle logs may be viewed and reprinted at any time from the Management program.

1. Display the Windows desktop by minimizing all running programs.
2. Double-click on the **ADV** folder to open the folder.

**Figure 30 ADVANTAGE System Folder on the Desktop**

3. Double-click on the **Management** icon.

**Figure 31 ADVANTAGE Management Application**

4. Log in to the Management application.

5. On the Management screen sidebar, click on the **General** tab.

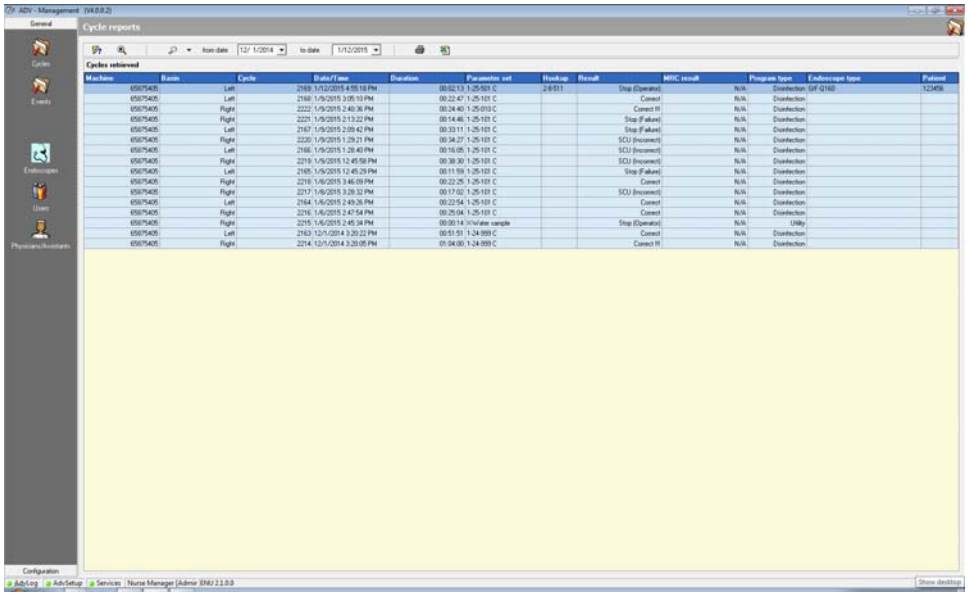
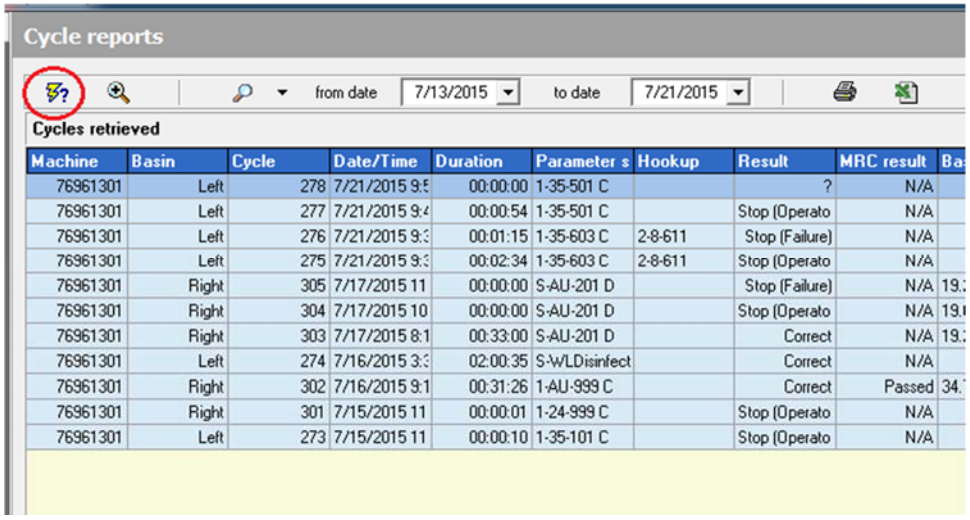


**Figure 32 Management**

6. On the sidebar, click on the **Cycles** icon.
7. On the blank Cycle Reports screen, set the **From Date** and **To Date** parameters, and then click on the **Generate** icon (lightning bolt) in the toolbar.
8. Once the Cycle Reports screen populates, double-click on the desired cycle.




| Machine | Basin | Cycle | Date/Time | Duration | Parameter s | Hookup | Result | MRC result | Ba |
|---|---|---|---|---|---|---|---|---|---|
| 76961301 | Left | 278 | 7/21/2015 9:5 | 00:00:00 | 1-35-501 C | | ? | N/A | |
| 76961301 | Left | 277 | 7/21/2015 9:4 | 00:00:54 | 1-35-501 C | | Stop (Operato | N/A | |
| 76961301 | Left | 276 | 7/21/2015 9:3 | 00:01:15 | 1-35-603 C | 2-8-611 | Stop (Failure) | N/A | |
| 76961301 | Left | 275 | 7/21/2015 9:3 | 00:02:34 | 1-35-603 C | 2-8-611 | Stop (Operato | N/A | |
| 76961301 | Right | 305 | 7/17/2015 11 | 00:00:00 | S-AU-201 D | | Stop (Failure) | N/A | 19. |
| 76961301 | Right | 304 | 7/17/2015 10 | 00:00:00 | S-AU-201 D | | Stop (Operato | N/A | 19. |
| 76961301 | Right | 303 | 7/17/2015 8:1 | 00:33:00 | S-AU-201 D | | Correct | N/A | 19. |
| 76961301 | Left | 274 | 7/16/2015 3:3 | 02:00:35 | S-WLDisinfect | | Correct | N/A | |
| 76961301 | Right | 302 | 7/16/2015 9:1 | 00:31:26 | 1-AU-999 C | | Correct | Passed | 34. |
| 76961301 | Right | 301 | 7/15/2015 11 | 00:00:01 | 1-24-999 C | | Stop (Operato | N/A | |
| 76961301 | Left | 273 | 7/15/2015 11 | 00:00:10 | 1-35-101 C | | Stop (Operato | N/A | |

**Figure 33 Cycle Reports Screen**

9. Click on the **Report** icon (paper with blue arrow) to display the Cycle Report.

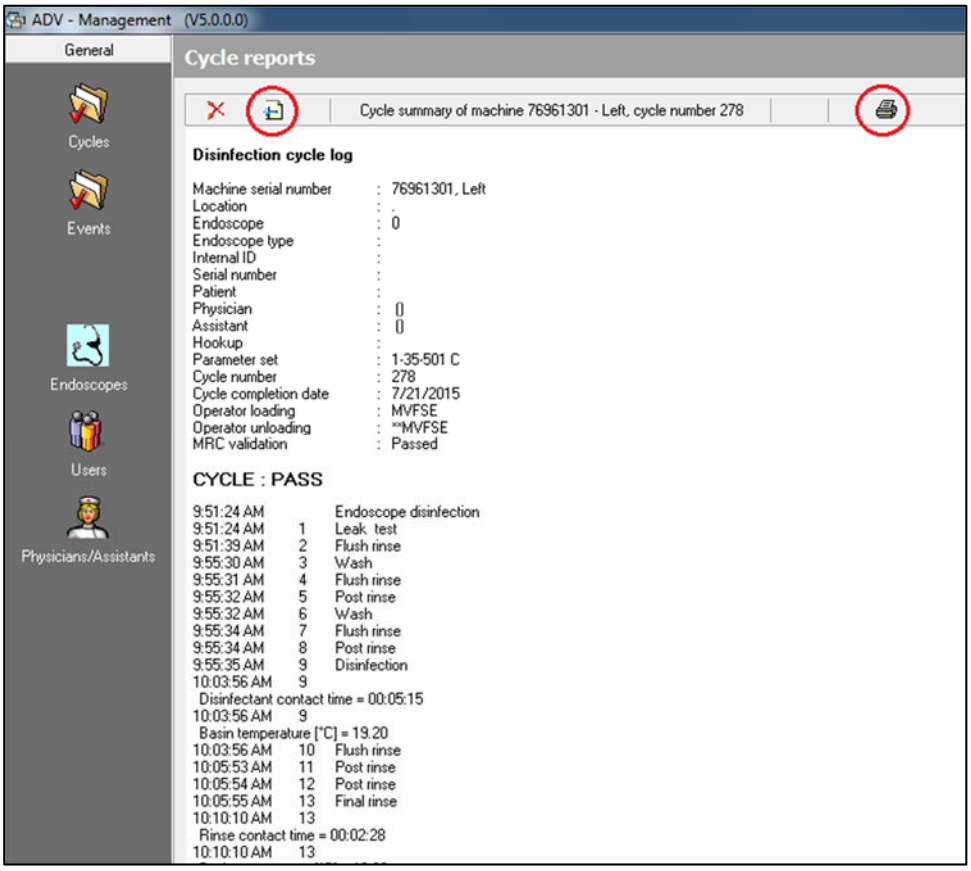



**Figure 34 Cycle Report**

10. Click on the **Printer** icon to print a copy of the report.

# CHAPTER 4

## Chemistry and Utilities

This chapter contains the process for replacing disinfectant, alcohol and detergent. Along with the processes for running the water line disinfect, wash test, final rinse water sample and take water sample utilities.

# Chemistry

## Disinfectant

The two disinfectant containers serve both the left and right basins. One container holds RAPICIDE® PA High-Level Disinfectant Part A while the other container holds RAPICIDE PA High-Level Disinfectant Part B of the disinfectant solutions. The ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor automatically mixes the two parts with water at the appropriate time during the disinfection cycle.

Part A uses a blue cap, and is positioned to the left as you look into the front of the ADVANTAGE PLUS Pass-Thru Reprocessor. Part B uses a white cap, and is positioned to the right as you look into the front of the ADVANTAGE PLUS Pass-Thru Reprocessor. Part A and B must always be positioned in the correct location in the reprocessor, and must always be attached to the appropriately colored cap. To facilitate the correct connection, the blue cap is larger than the white cap, and only fits the Part A container. The smaller white cap only fits the Part B container.

## Detergent and Alcohol (Optional)

The detergent and alcohol reservoirs serve both the left and right modules.

The alcohol reservoir is located on the right service door.  The reservoir is threaded into a captive header and is removed by unscrewing the body. The alcohol must be 70% isopropyl.

The detergent reservoir is located in the chemical drawer.  An uptake tube is placed directly into the INTERCEPT® PLUS Detergent container. The detergent must be INTERCEPT PLUS Detergent manufactured by Medivators Inc.

## Fluid Reservoir Status

The system monitors the use of disinfectant, alcohol, and detergent. An estimate of the fluid remaining appears at the bottom of the LIO screen.

**Figure 35 Chemistry Reservoir Levels**

If the fluid reservoir status indicates that the detergent or alcohol volume is empty, then you must follow the loading process to fill the appropriate fluid reservoir.

The fluid levels in the detergent and alcohol reservoirs are monitored with float switches. A cycle cannot be initiated if sufficient fluid is not available. The replace fluid utilities must be run once out of fluid is detected even though the reservoirs have been refilled.

## Replacing Fluids

**WARNING Refilling the container with the incorrect fluid may cause the endoscope to be improperly disinfected. Do not use the endoscope on a patient if this occurs.**

**WARNING Wear protective clothing, gloves and eye wear**. **The disinfectant and detergent manufacturers may recommend additional protection.**

**Note**: All chemistry is replaced from the dirty side of the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor.

## Replacing Disinfectant

**Note**: Only replace RAPICIDE® PA High-Level Disinfectant when prompted by LIO, “Part A/B container empty, run “replace fluids utility”. Do not replace the RAPICIDE PA High-Level Disinfectant based on the fuel reservoir status reading 0%.

**Note**: Replace both Part A and Part B at the same time regardless of whether LIO prompts to replace just Part A or Part B.

**Figure 36 Chemical Drawer**

**Replace Disinfectant Containers:**

When either RAPICIDE® PA High-Level Disinfectant Part A or B containers are empty, the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor will stop and prompt the operator to replace either Part A or B.

1. Open the chemical door and pull out the drawer.
2. Prepare a new disinfectant container and place it on the floor next to the drawer.
3. Loosen the cap on the uptake tube and with one hand remove the uptake tube from the empty container.
4. With the other hand remove the empty container and set it aside and then place the new container in its place in the drawer. The uptake tube side of the container should face the back of the reprocessor.
5. Insert the uptake tube and tighten the cap.
6. Repeat for the other disinfectant container.

**Figure 37 Replacing the Disinfectant Container**

**Enter information into ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor by:**

1. Press the **Menu** button on the control panel.
2. Scan the **Operator's** barcode.
3. Select **Replace Fluids** from the **Main** Menu on the touchscreen, confirm by pressing **OK**.
4. Select either **Component A** or **Component B** from the **Replace Fluids** Menu, confirm by pressing **OK**.
5. Scan the disinfectant lot number, confirm by pressing **OK**.
6. Perform the above steps for both **Component A** or **Component B.**
7. Press the **START** button on the control panel to resume the cycle.

**CAUTION** Refer to the disinfectant manufacturer's directions for the proper disposal of the empty containers.

**Note**: Upon replacing RAPICIDE® PA High-Level Disinfectant Part A and B containers, the Replace Fluids utility must be run. A reprocessing cycle cannot be initiated if an empty disinfectant container has been detected. The Replace Fluids utility must be run to clear the error condition.

## Replacing Detergent

### Replace Detergent Container:

1. Open the chemical door and pull out the drawer.
2. Prepare a new detergent container and place it on the floor next to the drawer.
3. Loosen the cap on the uptake tube and with one hand remove the uptake tube from the empty container.
4. With the other hand remove the empty container and set it aside and then place the new container in its place in the drawer. The uptake tube side of the container should face the back of the reprocessor.
5. Insert the uptake tube and tighten the cap.

**Figure 38 Replacing the Detergent Container**

**Enter information into ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor by:**

1. Press the **Menu** button on the control panel.
2. Scan the **Operator's** barcode.
3. Select **Replace Fluids** from the **Main** Menu on the touchscreen, confirm by pressing **OK**.
4. Select **Detergent** from the **Replace Fluids** Menu, confirm by pressing **OK**.
5. Scan the detergent lot number, confirm by pressing **OK**.

**Note**: Upon refilling of the alcohol reservoirs and detergent containers, the Replace Fluids Utility must be run. If a container empty condition has been detected, the Replace Fluids utility must be run to correct the error condition.

## Replacing Alcohol

### Refill Alcohol Container:

1. Remove the alcohol container from the right service door by unscrewing the body.
2. Refill with 70% isopropyl alcohol to the fill line.
3. Place the alcohol container back in the reprocessor.

**Figure 39 Alcohol Container**

**Enter information into ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor by:**

1. Press the **Menu** button on the control panel.
2. Scan the **Operator's** barcode.
3. Select **Replace Fluids** from the **Main** Menu on the touchscreen, confirm by pressing **OK**.
4. Select **Alcohol** from the **Replace Fluids** Menu, confirm by pressing **OK**.
5. Enter the alcohol lot number, confirm by pressing **OK.**

# Utilities

## Water Line Disinfection

The ISO 15883-4:2008 (Washers-disinfectors Part 4) water quality standard requires that chemical disinfection of the water treatment (filtration) and delivery system must be performed on a weekly basis and whenever the 0.2 micron bacterial retentive filter is replaced. This standard requires that all rinse water delivered to the washer/disinfector contain no more than 10 cfu (colony forming units) per 100 ml.
Microbiological quality of even potable water varies considerably. If you are unsure of the microbiological quality of your washer/disinfector supply water, you should have it tested according to either local or internal guidelines.

The Water Line Disinfection program or utility is used to disinfect both the water line and the water filter. Activating this utility fills the water line and water filter with disinfectant, and circulates it through the internal plumbing and the basin.

There are four water line disinfection programs available:

- **S-WLDisinfect-2hr:** Water line disinfection with 1 hour soak time, complete cycle is 2 hour.
- **S-WLDisinfect-6hr:** Water line disinfection with 4 hour soak time, complete cycle is 6 hours.
- **S-WLDRecovery:** Water line disinfection with 10 minute soak time, complete cycle is 1 hour.
- **S-WLDRinse:** Used to recover after failed water line disinfection or as a service test, complete cycle is 30 minutes.

**To Start the Water Line Disinfection:**

1. Ensure that the disinfectant reservoirs are not empty and the water supply is turned on.
2. For each basin open the door by pressing the **Open/Close Door** button on the control panel.
3. Remove any endoscope(s).

4. Install a **Disinfection Block** in each basin.

**Figure 40 Disinfection Block Installed**

5. Press the **Menu** button for the left basin on the control panel. The left side of the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor controls this utility.

6. Scan the **Operator** barcode.
7. From the **Main** Menu on the touchscreen select **Programs** and press **OK**.

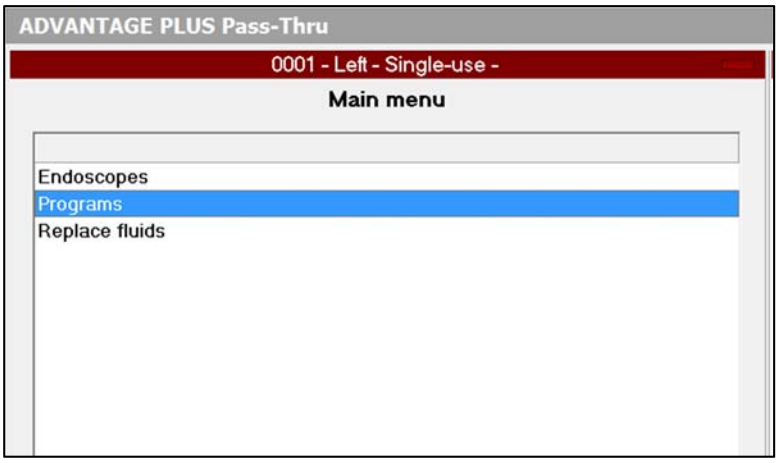



**Figure 41 Programs Menu**

8. Select **Water line disinfect** from the **Programs** screen and press the **OK** button.

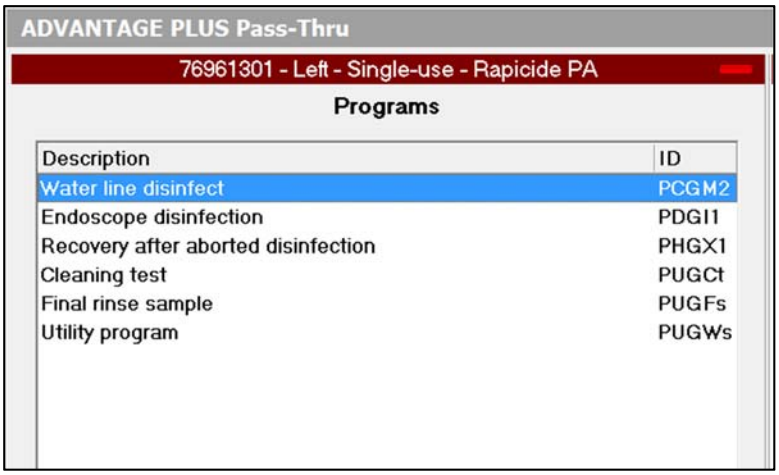



**Figure 42 Water Line Disinfect**

9. When the **Parameter set**s screen opens, choose the appropriate water line disinfection program and press **OK**.

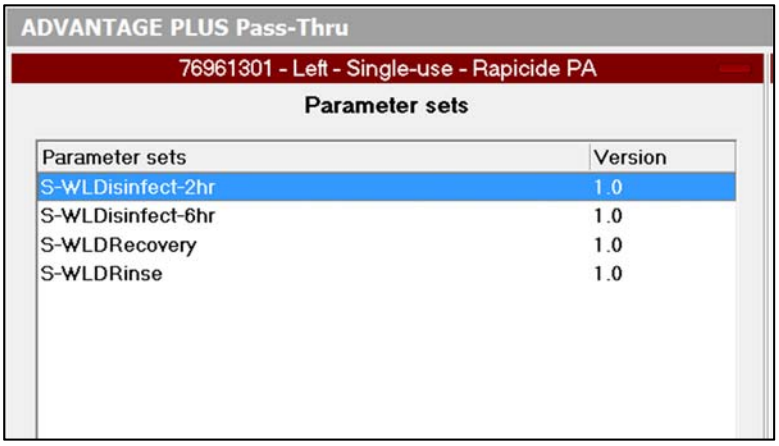



**Figure 43 Water Line Disinfect Parameter Selection**

7. An informational screen is displayed to verify that the disinfection blocks are installed. Select the **OK** button to confirm the blocks are in place.

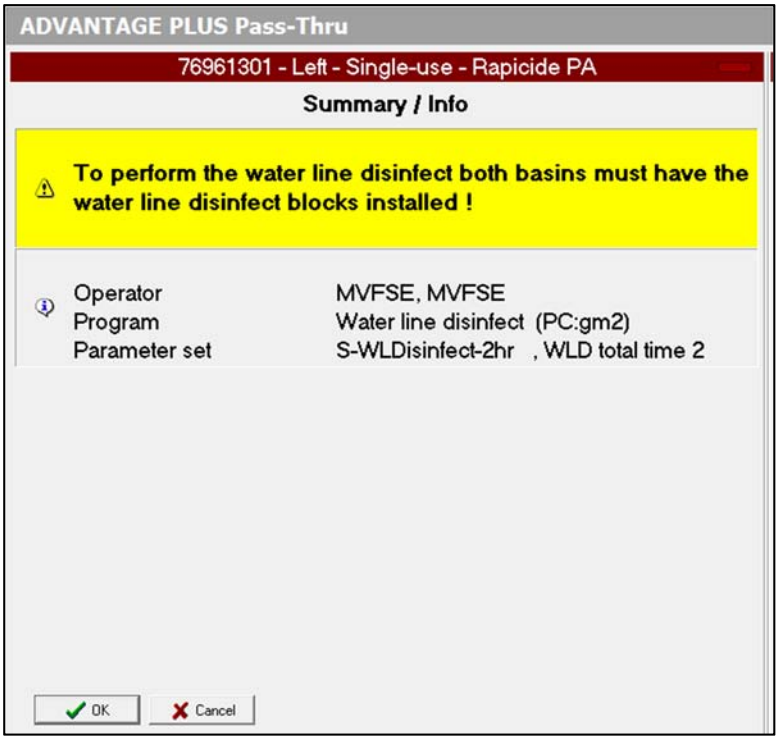

ADVANTAGE PLUS Pass-Thru
76961301 - Left - Single-use - Rapicide PA
Summary / Info
To perform the water line disinfect both basins must have the water line disinfect blocks installed !
Operator
MVFSE, MVFSE
Program
Water line disinfect (PC:gm2)
Parameter set
S-WLDisinfect-2hr , WLD total time 2
OK
Cancel

**Figure 44 Prompt to Install Disinfection Blocks**

11. The cycle will start automatically or press the **Start** button on the control panel to initiate the water line disinfection. Disinfectant is flushed through the water line and water filtration system. The disinfectant remains in the water filter and water lines while the system is disinfected. The water lines and filter are flushed, the basin is rinsed and the utility terminates.

12. Once the process is complete, LIO will prompt the operator to open the left basin door. Press the **Left Door Open/Close** button on the control panel and scan the **Operator** barcode when prompted.
13. Open the right door and remove the disinfection blocks from both basins.

## Wash Test Utility

The wash test utility allows the operator to verify the effectiveness of the wash cycle with a wash challenge device. The utility can be run in either basin. Once the wash test utility has started, the door will close and the cycle will begin. After the wash phases the dirty side door will open and the wash challenge device can be removed from the basin.

1. Place the appropriate hookup block and wash challenge device in the basin the wash test utility is to be run.
2. Press the **Menu** button on the control panel.
3. Login by scanning an **Operator** barcode.
4. From the **Main Menu** on the touchscreen select **Programs**.
5. From the **Programs** menu select **Wash Test**.
6. The cycle will automatically start, if not press the **Start** button on the control panel.
7. When prompted and the door opens remove the wash challenge device from the basin.
8. Once removed press **Start** on the control panel.
9. When prompted press the **Open/Close Door** button on the control panel and scan the **Operator** barcode when prompted.

## Final Rinse Water Sample Utility

The final rinse water sample utility allow the operator to take a sample of the final rinse water for testing. The utility can be run in either basin. Once the final rinse water sample utility has started, the door will close and the cycle will begin. During the final rinse the dirty side door will open and a water sample can be gathered from the basin.

1. Place a test block in the basin the utility is to be run.
2. Press the **Menu** button on the control panel.
3. Login by scanning an Operator barcode.
4. From the **Main Menu** on the touchscreen select **Programs**.
5. From the **Programs** menu select **Final Rinse Water Sample**.
6. The cycle will automatically start, if not press the **Start** button.
7. When prompted and the lid opens take a water sample form the basin.
8. Once the water sample has been taken press **Start** on the control panel.
9. When prompted press the **Open/Close Door** button on the control panel and scan the **Operator** barcode when prompted.

## Take Water Sample Utility

The take water sample utility allows for the gathering of a water sample from the fluid inlet in the basin. The utility can be run in either basin. Once the Take water sample utility has started, the door will close and 15 liters of water will be run through the water filters into the basin. The dirty side door will open and a water sample can be gathered from the fluid inlet in the basin.

1. Place a machine disinfection block in the basin the utility is to be run.
2. Press the **Menu** button on the control panel.
3. Login by scanning an Operator barcode.
4. From the **Main Menu** on the touch screen select **Programs**.
5. From the **Programs** menu select **Utility program**.
6. From the **Utility program** menu select **Take water sample**.
7. The cycle will automatically start, if not press the **Start** button on the control panel.
8. Take a water sample from the Fluid Inlet in the basin.
9. Once the water sample has been taken press **Start** on the control panel.
10. When prompted press the **Open/Close Door** button on the control panel and scan the **Operator** barcode when prompted.

# CHAPTER 5

## MAINTENANCE

This chapter contains basic service procedures required for maintaining the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor. Strict adherence to these requirements guarantees optimum continuous quality in endoscope reprocessing. Failure to perform required maintenance may result in injury or death to the operator or patient.

# Weekly Maintenance

**Note** All maintenance is performed on the dirty side of the reprocessor.

### Inspection

Inspect the following on a weekly basis. Adjustments or changes should be made by a qualified service technician.

1. **Hookup Blocks:** Check for cracks in the hookup hoses, especially at the connections to the connector block. If cracks have formed, the connector assembly should be replaced. Ensure all fittings are tight on the hookup block.
2. **Cassette:** Check for cracks and damage to the cassettes. If damage is found dispose of the damaged cassette and replace.
3. **Basin Doors:** The basin doors should open and close easily. Monitor the basin doors for any signs of fluid leaks. Fluid leaks could expose the operator to chemicals and contamination.

### Routine Cleaning

For routine cleaning of all exterior surfaces of the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor, mild detergents, multipurpose cleaners or disinfectant wipes can be used.

**Areas to be cleaned**: Barcode scanner, control panels, touchscreen, doors, exterior surfaces.

### Channel Manifold O-ring Lubrication and Inspection

1. Using a lint free cloth, dry the O-rings on the connection manifold located in each basin.
2. Visually inspect the O-rings for damage, nicks or cuts. If needed the O-rings can be removed for inspection.
3. If an O-ring is damaged or missing replace with MEDIVATORS part number 3-8-110.
4. Place a small amount of O-ring oil (silicone oil, MEDIVATORS part number 17599-496) between the thumb and index finger and spread the oil lengthwise along the connection manifold O-rings with your thumb and index finger. There are a total of eight per basin.
5. Repeat these two steps for the other basin.

**Figure 45 Channel Manifold O-rings**

## Hookup O-ring Lubrication and Inspection

1. Using a lint free cloth, dry the O-rings on all hookup connectors.
2. Inspect the O-rings for damage, nicks and cuts.
3. If an O-ring is damaged or missing, take the hookup out of service and contact Medivators to order hookup service parts
4. Place a small amount of O-ring oil (silicone oil, MEDIVATORS part number 17599-496) between the thumb and index finger and spread evenly an all hookup O-rings.

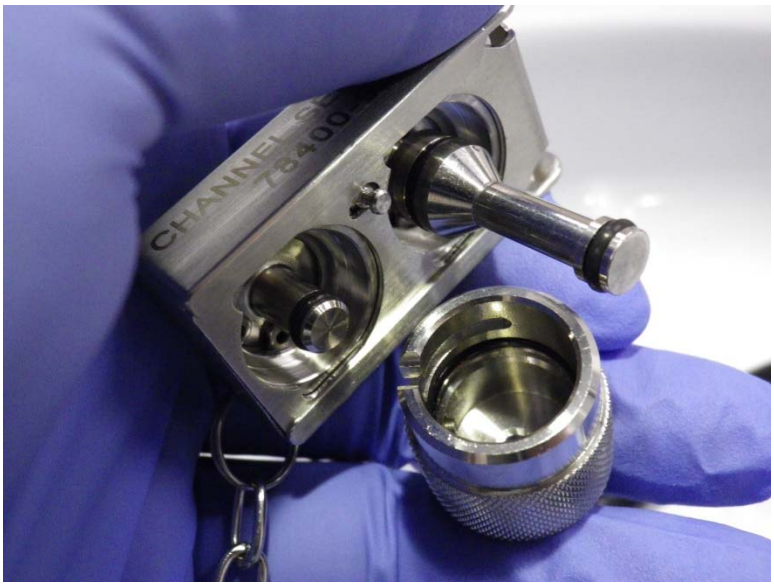


**Figure 46 Example of Hookup O-rings**

**Restart Computer**

To maintain the health of the reprocessors' computer it is recommended to restart the computer once a week.

1. Ensure cycles are not running in either basin and close all doors.
2. Using the touchscreen or mouse click on the Windows Start button.
3. Click on the arrow next to the Start button and choose Restart.
4. Allow the computer to shut down and restart, do not interrupt.
5. Once the computer restarts all applicable programs will auto start and the reprocessor will be ready to use.

**Water Line Disinfection**

In order to ensure the required water quality standards are met the water line disinfection must be performed weekly.

1. Ensure that the disinfectant reservoirs are not empty and the water supply is turned on.
2. For each basin open the door by pressing the **Open/Close Door** button on the control panel.
3. Remove any endoscope(s).
4. Install a **Disinfection Block** in each basin.
5. Press the **Menu** button for the left basin on the control panel. The left side of the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor controls this utility.
6. Scan the **Operator** barcode.
7. From the **Main Menu** on the touchscreen select **Programs** and press **OK**.
8. Select **Water line disinfect** from the **Programs** screen and press the **OK** button.
9. When the **Parameter sets** screen opens, choose the appropriate water line disinfection program and press **OK**.
10. An informational screen is displayed to verify that the disinfection blocks are installed. Select the **OK** button to confirm the blocks are in place.
11. The cycle will start automatically or press the **Start** button on the control panel to initiate the water line disinfection. Disinfectant is flushed through the water line and water filtration system. The disinfectant remains in the water filter and water lines while the system is disinfected. The water lines and filter are flushed, the basin is rinsed and the utility terminates.
12. Once the process is complete, LIO will prompt the operator to open the left basin door. Press the **Left Door Open/Close** button on the control panel and scan the **Operator** barcode when prompted.
13. Open the right door and remove the disinfection blocks from both basins.

# Monthly Maintenance

### Basin Drain Filter and Drain Screen

The basin drain filters and drain screen are located in the drains of each basin.

1. Using the supplied filter hook first remove the basin drain screen, the basin drain screen is the round metal disc with small holes that snaps into the basin drain.
2. Visually inspect the basin drain screen for debris, clean under running water in a sink.
3. Using the same filter hook remove the basin drain filter and discard.
4. Install the new basin drain filter.
5. Reinstall the basin drain screen.

**Figure 47 Basin Drain Screen and Basin Drain Filter Removal**

### Spray Arm Screen

To access the spray arm screen open the outer doors as well as the inner service doors. The spray arm filters are located under each basin to the left of the drain manifold.

1. Place a towel over the area below the spray arm drain screen.
2. Unscrew the cap counter clockwise, fluid will be present.
3. Remove the screen and clean, the screen is not replaced.
4. Place cleaned screen back in the housing.
5. Reattach the cap; ensure the red seal is in place in the cap.

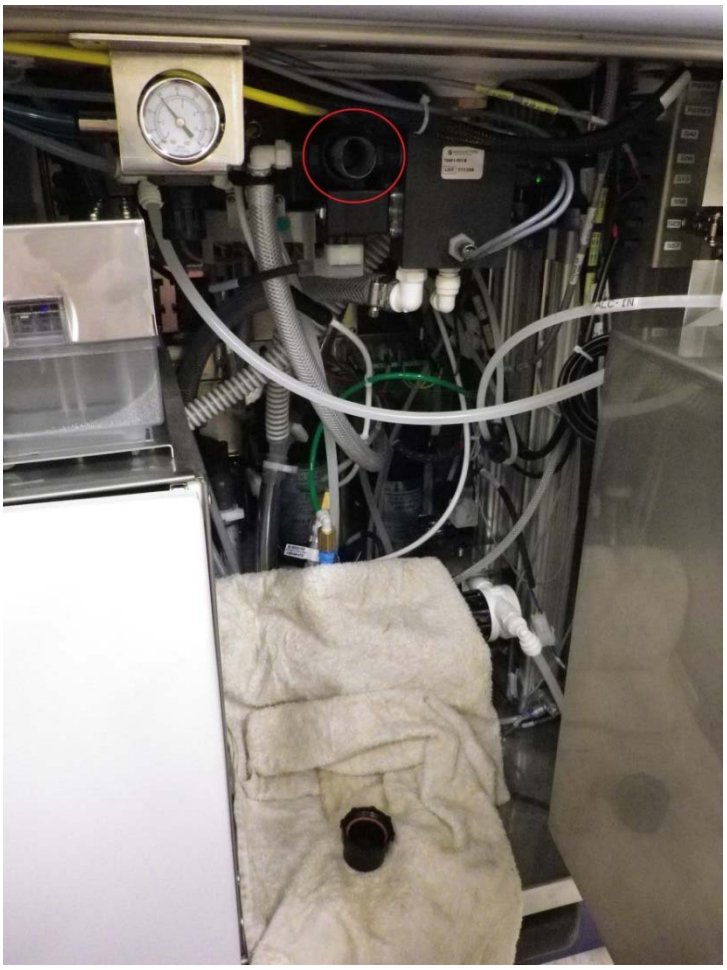


**Figure 48 Spray Arm Screen Location (Right Basin)**

**Figure 49 Spray Arm Screen**

# 6 Month Maintenance

### Air Filter Replacement

The ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor uses four 0.2 micron air filters to prevent any contaminants from reaching the channels of the endoscopes during air purges and channel monitoring. Each filter should be replaced every 6 months.

To access the air filters open the outer doors as well as the inner service doors. The air filters are located on the floor of the reprocessor to the left and right of the chemical drawer, two on each side.

1. Replace one filter at a time.
2. Press the gray button on the quick connect fittings to release the filter.
3. Remove and discard the old filter.
4. Replace the filter by attaching the quick connect fittings. Ensure that the color coded fittings match.
5. Close the doors.

**Figure 50 Air Filters**

## 0.2 Micron Water Filter Replacement

The 0.2 micron water filters (left and right basin) must be replaced every 6 months regardless of the condition of the filter. Facility water quality may require the filters to be changed sooner. The water line disinfection must be performed after these filters are

changed.  Refer to the Water Filter Replacement section in this chapter for directions on changing these filters.

## 0.4 micron Water Filter Replacement

The 0.4 micron water filter should be replaced every 6 months.  Facility water quality may require the filter to be changed sooner.  Refer to the Water Filter Replacement section in this chapter for directions on changing this filter.

## Water Filter Replacement

**WARNING When replacing the water filter, make sure that the filter being removed is the same as the filter replacing it.**

**WARNING Only use MEDIVATORS supplied water filters to ensure the proper water quality for endoscope disinfection.**

**WARNING A water line disinfection must be performed after the 0.2 micron water filter is replaced.**

The water filtration system removes particulates and biological contaminants as small as 0.2 micron from the supply water. During the water line disinfection procedure, the entire water filtration system and the incoming water line for the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor is disinfected.

**Figure 51 The Water Filtration System**

Water filters should be replaced at a minimum every 6 months for both the 0.4 micron filters and the 0.2 micron filters. Facility water quality may require the filters to be changed sooner.

The following conditions must be met before changing a filter:

- No endoscope reprocessing cycles are running.
- No water line disinfection procedure is running.
- The inlet water supply is turned off.

You will need the following supplies:

- A towel.
- The filter drain hose.
- A container to catch water.
- A filter wrench.
- The necessary filter cartridges (See Appendix B for replacement part numbers).

## Replacing the 0.4 micron Water Filter

1. Ensure that facility water supply is turned off.
2. Place a disinfection block in the left basin.
3. Relieve the water pressure in the water filtration system by running the **Take water sample** utility.
    a. Place a machine disinfection block in the left basin.
    b. Press the **Menu** button on the control panel for the left basin.
    c. Login by scanning an **Operator** barcode.
    d. From the **Main Menu** on the touch screen select **Programs**.
    e. From the **Programs** menu select **Utility program**.
    f. From the **Utility program** menu select **Take water sample**.
    g. The cycle will automatically start, if not press the **Start** button on the control panel.
4. A **No Water Supply** alarm will occur, move to the next step.
5. Open the left access door and place a towel in the area below the 0.4 micron filter housing.

**Figure 52 The 0.4 micron Filter housing**

6. Place a container on the floor in front of the filter housing.
7. Disconnect the hose at the bottom of the filter housing and connect the supplied filter drain hose in its place. Place the loose end into the container on the floor.
8. Using the supplied filter bowl wrench loosen the filter housing (do not remove) to allow the water in the filter housing to drain into the container.

**Figure 53 Loosening the Filter Housing**

9. Once the filter housing has emptied remove the housing using the filter wrench.
10. Remove the used filter and discard.

**Figure 54 Removing and Replacing the 0.4 micron Filter**

11. Place a new filter in the upper housing.
12. Ensure that the O-ring on the filter housing is in place and well lubricated with silicone grease.

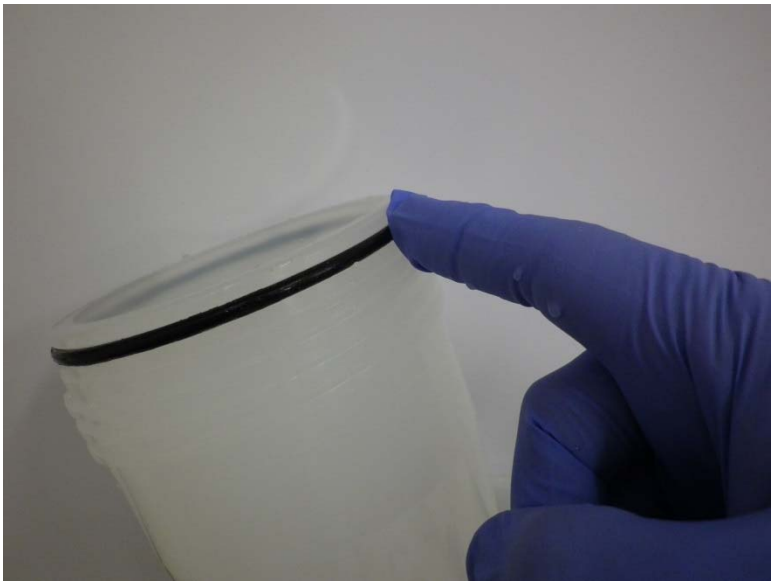


**Figure 55 Lubricate the Filter Housing O-ring**

13. Thread the housing onto the header and tighten by hand only. Never use the filter wrench to tighten the filter housing.
14. Remove the filter drain hose and reconnect the hose from the reprocessor to the bottom of the filter housing
15. Turn on the facility water supply.
16. Continue the Water Sample Utility in the basin by pressing the **Start** button.
17. Once water flows into the left basin, bleed air out of the 0.2 micron filter by slightly opening the vent cap (do not remove). Once water comes out close the vent cap.

**Figure 56 Bleed the 0.2 micron Filter**

18. Cancel the Water Sample Utility and remove the disinfection block from the left basin.

## Replacing the 0.2 micron Water Filters

When replacing the 0.2 micron filters, replace both the left and right filters at the same time.

**Note:** A water line disinfection must be performed after the 0.2 micron water filter is replaced. Refer to Chapter 4 for directions.

1. Place a towel in the area below the 0.2 micron filter and a container on the floor in front of the filter.
2. Disconnect the top of the filter and tip the filter into the container on the floor.

**Figure 57 Disconnect the Upper Connection on the Filter**

**Figure 58 Tip the Top of the Filter into the Container**

3. Disconnect the bottom of the filter and discard the used filter.

**Figure 59 Remove the Old Filter**

4. Attach the new filter to the quick connects ensuring the flow arrows are pointing up.
5. Place a disinfection block in the basin.
6. Run the **Take water sample** utility for the basin the filter is being changed.
    a. Place a machine disinfection block in the basin the filter is being changed.
    b. Press the **Menu** button on the control panel for the basin the filter is being changed.
    c. Login by scanning an **Operator** barcode.
    d. From the **Main Menu** on the touch screen select **Programs**.
    e. From the **Programs** menu select **Utility program**.
    f. From the **Utility program** menu select **Take water sample**.
    g. The cycle will automatically start, if not press the **Start** button on the control panel.
7. Once water enters the basin slightly open the vent cap on the filter (do not remove) to bleed the air out. Close the vent cap once water comes out.

**Figure 60 Bleed the 0.2 micron Filter**

8. Cancel the **Take water sample** utility.
9. Repeat the process for the other 0.2 micron filter.

10. Perform a **Water Line Disinfection**.
    a. Ensure that the disinfectant reservoirs are not empty and the water supply is turned on.
    b. For each basin open the door by pressing the **Open/Close Door** button on the control panel.
    c. Remove any endoscope(s).
    d. Install a **Disinfection Block** in each basin.
    e. Press the **Menu** button for the left basin on the control panel. The left side of the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor controls this utility.
    f. Scan the **Operator** barcode.
    g. From the **Main Menu** on the touchscreen select **Programs** and press **OK**.
    h. Select **Water line disinfect** from the **Programs** screen and press the **OK** button.
    i. When the **Parameter sets** screen opens, choose the appropriate water line disinfection program and press **OK**.
    j. An informational screen is displayed to verify that the disinfection blocks are installed. Select the **OK** button to confirm the blocks are in place.
    k. The cycle will start automatically or press the **Start** button on the control panel to initiate the water line disinfection. Disinfectant is flushed through the water line and water filtration system. The disinfectant remains in the water filter and water lines while the system is disinfected. The water lines and filter are flushed, the basin is rinsed and the utility terminates.
    l. Once the process is complete, LIO will prompt the operator to open the left basin door. Press the Left **Door Open/Close** button on the control panel and scan the **Operator** barcode when prompted.
    m. Open the right door and remove the disinfection blocks from both basins.

## Computer Shut Down

When it is required to shut down the computer it is important to shut it down properly. If the computer is not shut down properly, damage can occur to the computer's operating system and hard drives. There are two methods for properly shutting down the computer on the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor computer.

1. From the **Windows Start menu** on the desktop choose **Shut Down** and allow the computer to shut down on its own.
2. Momentarily press the **Computer Power** button on the overhead control panel and allow the computer to shut down on its own.

A forced shut down can be performed by pressing and holding the **Computer Power** button on the overhead control panel for 3 seconds. This should only be performed when instructed by Medivators.

## Emergency Power Down

In the event of an emergency (fluid leak, smoke, etc..) the power can be quickly turned off to the reprocessor. To perform an emergency power down press and hold the **Main Power** button on either the clean or dirty overhead control panel for 3 seconds. The computer will stay powered even though the power has been disconnected from the rest of the reprocessor. A momentary press of the **Main Power** button will restore the power to the reprocessor

**Note**: If the Emergency Power Down procedure is performed in the middle of an endoscope disinfection cycle, the endoscope will need to be rerun to be disinfected.

## Complete Reprocessor Shut Down

In order to perform a complete reprocessor shut down the following steps are required.

1. Close the basin doors.
2. In the access panel in the wall above the reprocessor turn off the water and air supply.
3. Safely shut down the computer. From the Start menu on the desktop choose Shut Down and allow the computer to shut down on its own.
4. Power down the reprocessor by pressing the **Main Power** button on the overhead control panel for 3 seconds.

**Note**: If the reprocessor is going to be shut down for an extended period of time (more than overnight) completely dry out the basin before performing the complete shutdown.

## Emergency Door Opening

In the event of a power outage or reprocessor failure it may be required to remove an endoscope from a basin with inoperable doors. This process requires two people and should only be performed from the dirty side.

**CAUTION** From the Start menu on the desktop choose Shut Down and allow the computer to shut down on its own.

Wear appropriate PPE when removing the endoscope. Disinfectant may be left in the basin and the endoscope may not be disinfected.

1. Disconnect the air line at the quick disconnect located in the access panel in the wall above the reprocessor.
2. Attach the supplied Emergency Door Opening tool to the dirty side door to be opened.
3. One person push in and up on the Emergency Door Opening tool to open the door.
4. While the door is being held open the second person can reach in and remove the endoscope.
5. Once the endoscope has been removed the door can be allowed to close on its own by letting go of the tool.
6. Remove the tool from the door and reconnect the air line located in the access panel in the wall above the reprocessor.
7. Once the fault has been rectified a Recovery after Abort Cycle will need to be run on the basin where the endoscope was removed.

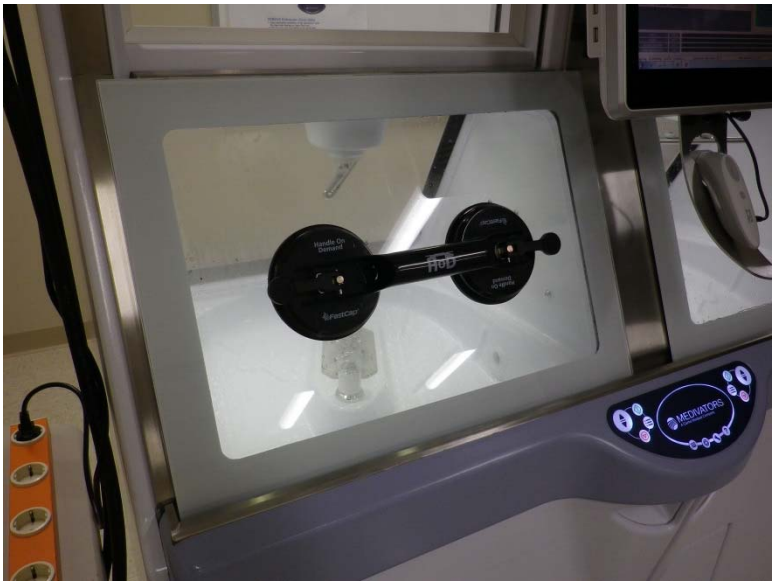


**Figure 61 Emergency Door Opening Tool**

# CHAPTER 6

## TROUBLESHOOTING

This chapter lists error messages you may encounter while using the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor. If the suggested action does not solve a problem or if the error reoccurs, contact your Technical Service representative.

# Introduction

## Error Messages

The ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor can report and display different types of error messages which signal and identify specific areas requiring attention. Error types include:

- **System Errors:** A communication problem identified by the prefix C with errors ranging from C-001 through C-099. This is an error caused by the Windows based computer or ADVANTAGE PLUS Pass-Thru Reprocessor.
- **Bar Code Errors:** A bar code problem identified by the prefix M with errors ranging from M-910 through M-940.
- **Endoscope Errors:** An endoscope problem identified by the prefix S with errors ranging from S-102 through S-177.
- **Reprocessing Cycle Errors:** A problem identified during the endoscope disinfection cycle identified by the prefix S with errors ranging from S-201 through S-297, and S-511 through S-832
- **Control Errors (SCU):** Lists any deviations in the disinfection program as monitored by the SCU controller, and identified by the pre-fix S with errors ranging from S-300 through S-399.
- **Warning Errors:** An alert or warning identified so that the operator is aware of a reprocessor condition that requires attention. Warnings are identified by the prefix W and range from W-701 through W-821.

## Onscreen Program Progress

The disinfection program consists of phases and steps. For each disinfection cycle, the phase names, status, and run codes appear on the monitor. Information for the left basin appears on the left side of the screen; information for the right basin is on the right side.

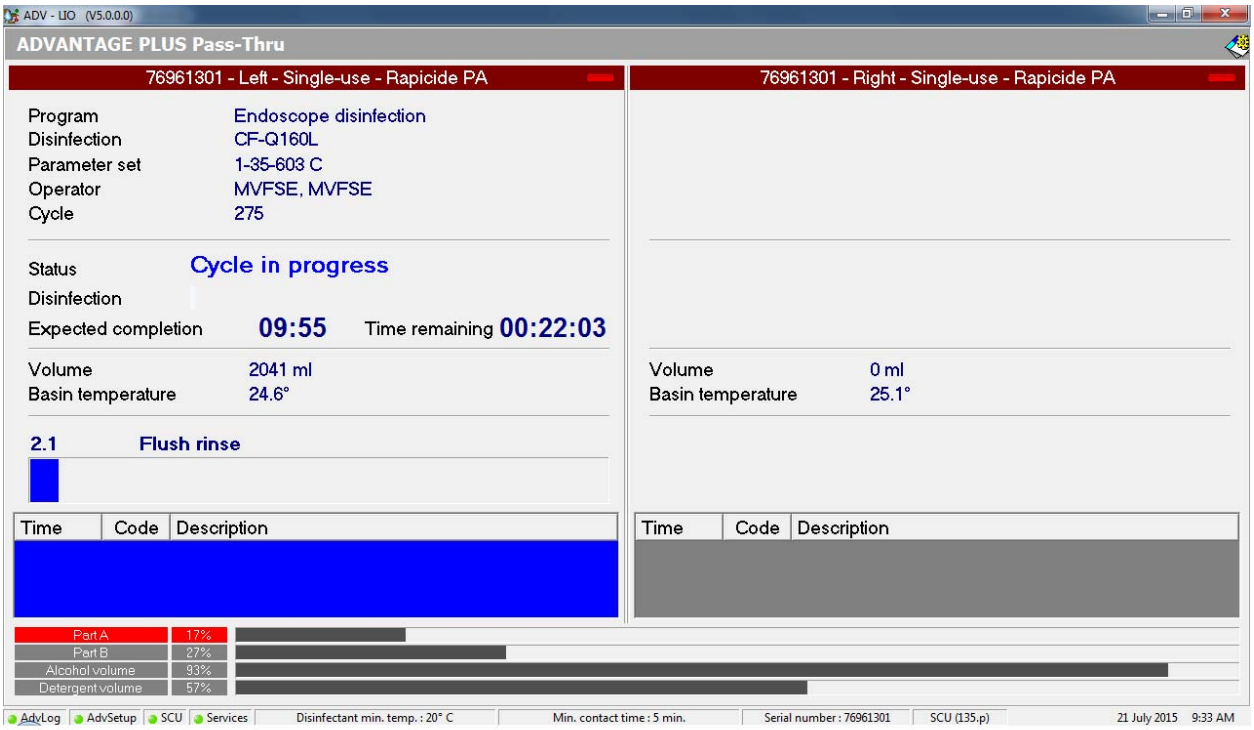



**Figure 62 Disinfection Cycle in Progress**

**Program Information**

This field displays operator and endoscope information as well as the normal progress of the disinfection program. The expected end time, on the left, of each window is fixed. Time remaining on the right, is measured from the start of the cycle. This counter normally decreases as a cycle progresses, but may increase or become fixed if an error occurs. The progression of the steps, below the timers, is illustrated with blue time bars. The real time is measured from the start of each step or phase.

**Cycle and Program Errors**

Operator messages and errors appear in the Reports field and communicate cycle progress. An audible alarm also sounds to communicate certain information.

A code number and short description of the report or error is shown, along with the elapsed time at which it is generated. The most recent message is at the top of the field. The meaning of each screen color is shown in the table below:

**Table 4 Screen Color and Program Status**

| | Screen | Program Status |
|---|---|---|
| 1 | Gray | Program in Standby |
| 2 | Orange | Standby, with door open or a warning is |
| 3 | Blue | Cycle in progress |
| 4 | Red | Error or cycle failed, endoscope not |
| 5 | Green | Cycle Completed Successfully, endoscope |
| 6 | Purple | Wash-only cycle completed successfully, endoscope not disinfected |

**System Errors**

Current system errors appear at the top of the screen in white letters on a red background. The message disappears once the error is corrected.

If a system error occurs during standby mode, a warning message appears as the fault occurs but disappears as the situation is corrected.

If the error occurs during a disinfection cycle, the program ends and fluids are pumped out of the basin. A recovery program runs until a safe state is reached and the endoscope can be removed. The recovery program cannot be stopped by the operator.

## Error Overview

Screen reports and errors are summarized by category and number in the following tables. More specific information including potential causes, and actions for each error are included following that. For complex problems, it is advisable to notify the maintenance department and/or your supervisor.

### System Errors

| Code | Description |
|---|---|
| C-001 | SCU error %d: %s |
| C-012 | No hardware definition received. Hardware not initiated |
| C-015 | Data cannot be retrieved, check the SQL-Server connection |
| C-016 | Run could not be configured, check SQL-Server connection |
| C-017 | User data could not be retrieved check SQL-Server connection |
| C-019 | The clock has been synchronized with the server computer (%s) |
| C-021 | The Expert control has been automatically closed, you have to logon again |
| C-030 | The previous run has ended incorrectly. Program aborted to a safe situation. |
| C-032 | A failure occurred during the execution of a run. Program aborted to a safe state. |
| C-033 | Program aborted to a safe situation, but incorrect parameter set |
| C-040 | Hardware definition contains an invalid signal %d |
| C-042 | Selected hardware definition not correct for "%s" type |
| C-052 | Automatic start of program is not possible in the current state |
| C-053 | Automatic start of program is not possible. Another program is active |
| C-060 | Delayed start of program is not possible in the current state. |
| C-080 | Tag-reader not available |
| C-085 | Amulet COM Port not connected |
| C-099 | Internal LIO failure: %s |

### Bar Code Errors

| Code | Description |
|---|---|
| M-910 | Unknown barcode "%s" |
| M-911 | ENDORA® Workflow error: Invalid Activity Endoscope "%s" |
| M-920 | Unknown operator tag "%s" |
| M-922 | The scanned tag is an unknown endoscope code. "%s" |
| M-930 | Barcode not found |
| M-940 | The code “%s” is not the correct %s code |

### Endoscope Errors

| Code | Description |
|---|---|
| S-102 | Start not allowed: Vent hook-up block |
| S-103 | Endoscope leak or connected incorrectly |
| S-104 | Minor endoscope leak, cycle continuing safely |
| S-105 | Leak test vented but pressure remains high |
| S-106 | Block not pressurized or not connected |
| S-112 | Start not allowed: Vent hook-up block |

S-113 No flow air channel
S-114 Blocked air channel
S-115 No pressure air channel
S-116 Air channel disconnected
S-117 Air channel disconnected
S-122 Start not allowed: Vent hook-up block
S-123 No flow biopsy channel
S-124 Blocked biopsy channel
S-125 No pressure biopsy channel
S-126 Biopsy channel disconnected
S-127 Biopsy/Suction channel disconnected
S-132 Start not allowed: Vent hook-up block
S-133 No flow jet channel
S-134 Blocked jet channel
S-135 No pressure jet channel
S-136 Jet channel disconnected
S-137 Jet channel disconnected
S-142 Start not allowed: Vent hook-up block
S-143 No flow suction channel
S-144 Blocked suction channel
S-145 No pressure suction channel
S-146 Suction channel disconnected
S-147 Suction/Biopsy channel disconnected
S-152 Start not allowed: Vent hook-up block
S-153 No flow water channel
S-154 Blocked water channel
S-155 No pressure water channel
S-156 Water channel disconnected
S-157 Water channel disconnected
S-162 Start not allowed: Vent hook-up block
S-163 No flow extra channel
S-164 Blocked extra channel
S-165 No pressure extra channel
S-166 Extra channel disconnected
S-167 Extra channel disconnected
S-172 Start not allowed: Vent hook-up block
S-173 No flow elevator channel
S-174 Blocked elevator channel
S-175 No pressure elevator channel
S-176 Elevator channel disconnected
S-177 Elevator channel disconnected

## Reprocessing Cycle Errors

**Code Description**

S-200 No system air pressure
S-201 Internal machine fluid leak, check drip tray

S-203 Wrong connection block
S-210 Clean side door open
S-211 Dirty side door open
S-222 Start not allowed: Check detergent pressure sensor
S-223 No detergent flow
S-224 Start not allowed: Detergent level low
S-241 Alcohol sensor defective
S-242 Start not allowed: Check alcohol pressure sensor
S-243 No alcohol flow
S-244 Start not allowed: Alcohol level low
S-266 Check drain pump
S-271 Start not allowed: Fluid in basin
S-272 Start not allowed: Basin not empty
S-273 Basin empty
S-274 Basin not emptying
S-275 Basin level dropped
S-276 Basin minimum level not reached
S-280 Flowmeter S16 has failed
S-281 No incoming water flow
S-282 Water inlet flow too high
S-283 Water inlet flow too low
S-285 No water supply
S-286 Volume measurement V1 > V2
S-287 Volume measurement V1 < V2
S-288 Unrequested inlet water detected
S-289 External water supply valve failed
S-292 Basin temperature sensor defective
S-293 Basin temperature too high
S-294 Basin temperature too low
S-295 Water temperature sensor reading incorrectly
S-297 Basin temperature too high
S-511 Measured contact time is too short
S-660 MRC validation failed
S-671 "Machine control" locked by the other side
S-672 Wrong system side
S-810 Check Part A container, run Replace Fluids Utility.
S-811 Check Part B container, run Replace Fluids Utility.
S-814 Part A fill sensors do not agree
S-815 Part B fill sensors do not agree
S-819 Dosing reservoir A empty sensor error
S-820 Part A container empty, run Replace Fluids Utility.
S-821 Part B container empty, run Replace Fluids Utility.
S-824 Dosing reservoir A not empty
S-825 Dosing reservoir B not empty
S-828 Part A dosing reservoir empty too soon
S-829 Part B dosing reservoir empty too soon

S-831 Air cylinder does not charge
S-832 Air cylinder not discharged

## Control Errors (SCU)

| Code | Description |
|---|---|
| S-300 | SCU |
| S-301 | SCU in "OK" state |
| S-302 | SCU: Wrong configuration |
| S-304 | SCU: No connection |
| S-310 | Spray arm speed below minimum |
| S-311 | Spray arm speed above maximum |
| S-350 | Manual control active |
| S-360 | Stopped by operator |

## Warning Errors

| Code | Description |
|---|---|
| W-701 | SCU: No connection |
| W-702 | SCU: Wrong configuration |
| W-703 | SCU: Incorrect status and doors inactive |
| W-704 | SCU: Incorrect status |
| W-705 | SCU: in "OK" status |
| W-711 | Dirty side door open |
| W-712 | Dirty side door will not open |
| W-713 | Dirty side door will not close |
| W-715 | Basin not empty |
| W-716 | Fluid leak detected |
| W-717 | No system air pressure |
| W-721 | Water temperature sensor defective |
| W-731 | Clean side door is open |
| W-732 | Clean side door will not open |
| W-733 | Clean side door will not close |
| W-743 | Sensor S03 Detergent high |
| W-744 | Sensor S17 Minimum level high |
| W-749 | Sensor S24 Alcohol high |
| W-751 | Sensor S11 Leak test high |
| W-757 | Sensor S33 high |
| W-764 | Channel sensor S04 high (Air) |
| W-765 | Channel sensor S05 high (Biopsy) |
| W-766 | Channel sensor S06 high (Jet) |
| W-767 | Channel sensor S07 high (Suction) |
| W-768 | Channel sensor S08 high (Water) |
| W-769 | Channel sensor S09 high (Extra) |
| W-770 | Channel sensor S10 high (Elevator) |
| W-800 | Manual control active |
| W-801 | Purge in progress |
| W-802 | Venting alcohol line, close door |

W-803 Discharging air cylinder, close door
W-805 Left side controls the water line disinfect
W-810 Open door to complete cycle
W-820 Disinfectant in the basin, (doors locked)
W-821 Disinfectant in supply lines, (doors locked)

# System Errors

**C-001: SCU error: %d: %s**

**Cause:** There is a temporary interruption in the connection between the SCU and the ADVANTAGE PLUS® Pass-Thru Reprocessor.
**Action:** Check the message at the lower left of the screen. If it says “SCU connected” then the connection has been restored. Press the Door Open/Close button or the Start button to continue. If the message says “disconnected” then attempt the action listed below.
**Cause:** There is a power failure in the reprocessor or the plug is loose.
**Action:** Check the plug. If it is not loose, report the failure to the maintenance department.

**C-012: No hardware definition received. Hardware not initiated.**

**Cause:** This error occurs if there is a problem with the SCU control software. This definition is the layout of the SCU control and is determined by the configuration of reprocessor. Possible issues are in the following list:

- Installation of the SCU layout is not found.
- The LIO program was incorrectly installed.
- Software problem.
- Communication problem with the SCU interface.

**Action:** Report the error to the ADVANTAGE PLUS Pass-Thru Reprocessor Manager.

**C-015: Data cannot be retrieved, check the SQL-Server connection.**

**Cause:** The connection to the database has been interrupted.

- The LIO program cannot retrieve the overview lists and the selection screen is empty.
- The connection to the server is interrupted in stand-by mode.
- It is not possible to start a program.

**Action:** Report the error to the system manager. As long as “Disconnected from server” appears at the bottom of the screen, the program cannot be restarted.

**C-016: Run could not be configured, check SQL-Server connection.**

**Cause:** The system is unable to retrieve information from database to set up a run.
**Action:** Report the error to the ADVANTAGE PLUS Pass-Thru Reprocessor Manager.

**C-017: User data could not be retrieved, check SQL-Server connection**

**Cause:** The system is unable to retrieve information from database to set up a run.
**Action:** Report the error to the ADVANTAGE PLUS Pass-Thru Reprocessor Manager.

**C-019: The clock has been synchronized with the server computer (%s)**

**Cause:** If the ADVANTAGE PLUS Pass-Thru Reprocessor clock and the server clock have a time difference of more than 30 seconds, the clock will be synchronized.

**Action:** No action is required.

**C-021: The Expert Control has been automatically closed, you have to logon again**

**Cause:** The Expert screen has timed out.

**Action:** To continue using the Expert functions login again.

**C-030: The previous run has ended incorrectly. Program aborted to a safe situation.**

If a system error occurs, then it is not possible to create a correct run report. If the error is repaired, then the error message disappears and the recovery program automatically runs to rinse the endoscope with water so that it can be safely removed of the reprocessor. This program cannot be stopped and the endoscope is not disinfected.

**Cause:** A black screen means the program is not visible. Possible causes are as follows:

- The computer was switched off.
- There is a computer defect.
- There was a power failure.

**Action:** Try pressing the On/Off switch on the computer. If this does not solve the error, contact the maintenance department.

**Cause:** There is a communication problem so the program cannot be run correctly. Possible causes are as follows:

- There is a cable fault.
- A cable is loose.
- There is a program error.
- The ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor control unit is defective.
- There is a blown or defective fuse.

**Action:** Contact the maintenance department and the system manager.

**Cause:** There is a communication problem with the SCU interface and message W-701 is also on the screen. Possible causes are as follows:

- There is a fault with the SCU interface.
- A network cable is disconnected.
- A cable is faulty.
- There is a communication problem with the server.
- There is a server error.

**Action:** Check the cable connection between the network and the reprocessor. Restore the connection if possible and start the reprocessor program again. If you are unable to repair the connection, report the error to the system manager

**Cause:** The LIO program was interrupted. Message W-703 also appears on the screen and the doors are locked.
**Action:** Start the recovery program.

**C-032: A failure occurred during the execution of a run. Program aborted to a safe situation**

If an SCU error occurs, then it is not possible to carry out a correct disinfection cycle. If the error is repaired, then this C-032 message appears and the recovery program is automatically selected. The endoscope is rinsed with water so that it can be safely removed from the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor but it will not be disinfected. The recovery program works automatically and cannot be stopped.

The endoscope must be run through a complete disinfection program before use.

**Cause:** There is an internal communication problem with the computer. Possible causes are as follows:

- There is a cable fault.
- A cable is loose.
- There is a program error.
- The SCU interface in the ADVANTAGE PLUS Pass-Thru Reprocessor is defective.
- A fuse is blown or defective.

**Action:** Report the problem to the maintenance department.

**Cause:** A new program was started while another one was already active.
**Action:** Press the Start button to start the recovery program.

**C-033: Program aborted to a safe situation, but incorrect parameter set**

**Cause:** An incorrect parameter set was selected for the reprocessor disinfection or the recovery program.
**Action:** Select the correct parameter set for the recovery program.

**Cause:** The LIO program was interrupted or shut down during a run. Message W-703 also appears and the lid cannot be opened.
**Action:** Start a recovery program.

**C-040: Hardware definition contains an invalid signal %d**

**Cause:** An incorrect address is entering the controller from the SCU.
**Action:** Report the error to the maintenance department. Note the unknown signal number: nn.

**C-042: Selected hardware definition not correct for “%s” type**

**Cause:** The system settings parameters for the left/right unit type have not been selected.
**Action:** Report the error to the ADVANTAGE PLUS Pass-Thru Reprocessor Manager.

**C-052: Automatic start of program is not possible in the current state**

**Cause:** There is warning text in the report field.
**Action:** Ensure that all error messages are resolved. Select a reprocessor disinfection auto start. If necessary, consult the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor Manager.

**Cause:** An auto start for endoscope disinfection is already set up.
**Action:** Cancel the auto start for the endoscope disinfection.

**C-053: Automatic start of program is not possible. Another program is active**

**Cause:** Reprocessor disinfection should start but there is an active cycle running.
**Action:** Let the current program run to completion. When the ADVANTAGE PLUS Pass-Thru Reprocessor is ready and the basin cover is still open, insert the reprocessor disinfection block and close the cover. The reprocessor disinfection will start automatically.

**C-060: Delayed start of program is not possible in the current state**

**Cause:** Warning messages (numbers W700-W799) are present on the screen during automatic startup of a disinfection program.
**Action:** Ensure that the messages are resolved. Select the automatic restart. Consult the maintenance department if necessary.

**Cause:** Auto start for another program is already set up.
**Action:** For the delayed start, the other program must first be shut down.

**C-080: Tag-reader not available**

**Cause:** The identification system is defective.
**Action:** Report the error to the maintenance department and the ADVANTAGE PLUS Pass-Thru Reprocessor Manager to have the chip (=Tag) system disconnected.

**C-085: Amulet COM Port not connected**

**Cause:** One of the clean side displays is not connected to the computer.
**Action:** Check the connections between the clean side display and the computer.

**C-099: Internal LIO failure: %s**

**Cause:** A wrong selection was executed when setting the reprocessor system parameters.
**Action:** Report the error to the ADVANTAGE PLUS Pass-Thru Reprocessor Manager to correct the settings. Then restart the program.

# Bar Code Errors

**M910: Unknown barcode**

If the system is set up to require the use of the bar code reader, manual selection with the cursor is not possible.

**Cause:** The bar code belongs to another item to be read.
**Action:** Check if the bar code type is the same as the selected input field on the screen. Scan the correct bar code again.

**Cause:** The bar code is not entered in the management system.
**Action:** Report the error to the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor Manager along with a request to add the bar code for the selected item.

**M-911: ENDORA workflow error: Invalid Activity Endoscope "%s"**

The system is set up with the ENDORA® Endoscope Tracking System and an endoscope was placed in the ADVANTAGE PLUS Reprocessor before the previous reprocessing steps were completed (i.e. pre-cleaning, leak test, manual cleaning).

**Cause:** An endoscope was placed in the ADVANTAGE PLUS Reprocessor before the previous reprocessing steps were completed (i.e. pre-cleaning, leak test, manual cleaning).
**Action:** Report the situation to the nurse manager.

**M-920: Unknown operator tag**

The system is set up to require use of the automatic identification system for operator identification.

**Cause:** The read tag is entered incorrectly or is not reported in the management database.
**Action:** Report the situation to the ADVANTAGE PLUS Pass-Thru Automated Endoscope Reprocessor Manager along with a request to add the correct tag code to the operator list.

**M-922: The scanned tag is an unknown endoscope code**

The system is set up to require use of the automatic identification system for endoscope selection.

**Cause:** The read tag is entered incorrectly or is not reported in the management database.
**Action:** Report the situation to the ADVANTAGE PLUS Pass-Thru Reprocessor Manager along with a request to add the correct tag code to the endoscope list.

**M-930: Barcode not found**

**Cause:** The barcode was read but the OK button was not enabled.
**Action:** Click the OK button.

**M-940: The code “%s” is not the correct %s code**

**Cause:** An incorrect code or lot number was entered while performing the

replace fluids utility for either the detergent or alcohol.
**Action:** Re-run the replace fluids utility and enter a valid code.

# Endoscope Errors

### S-102: Start not allowed: Vent hookup block

This message appears if no disinfection program is active and the leak test sensor is on. When this message occurs, no disinfection program can be started.

**Cause:** If the endoscope is vented too quickly, then it remains pressurized, causing the leak test sensor to be on.
**Action:** Stop the program and disengage the terminal block to reduce the pressure. This causes the message W-751 to disappear. If the error message remains, see the next cause and action below.

**Cause:** A faulty sensor faulty continues to incorrectly read on.
**Action:** Report the situation to the maintenance department for repairs.
**Cause:** The air valve leaks.
**Action:** Report the error to the maintenance department.

### S-103: Endoscope leak or connected incorrectly

**Cause:** The endoscope or connection hose is leaking seriously. The leak test connection is not in order.
**Action:** Use a manual leak tester (with a pressure gauge) to see if the endoscope leaks. If so, have the endoscope repaired. If there is no leak, check the endoscope connection and restart the program. If the report recurs, consult the maintenance department.
**Cause:** The block is out of alignment to the connection plate in the rinse basin.
**Action:** Stop the program, disconnect, and place the block anew. Restart the program.

### S-104: Minor endoscope leak, cycle continuing safely

**Cause:** Very tiny leak in the endoscope.
**Action:** Using the pressure gauge, pump the endoscope to pressurize and check to see if it is leaking. If there is a leak, report it to the maintenance department. If the endoscope is not leaking, see other causes of the error below.
**Cause:** Very tiny leak in the leak test system of the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor, the terminal connector, or the connection block.
**Action:** Consult the maintenance department to repair the leakage.
**Cause:** A power failure vents the endoscope and the error message follows.
**Action:** If the reprocessor automatically started up after the error, no further action is required. Otherwise, contact the maintenance department.
**Cause:** If the endoscope stays pressurized, a sensor is faulty.
**Action:** Report the situation to the maintenance department.

## S-105: Leak test vented by pressure remains high

**Cause:** There may be an air valve defect if air does not vent from the endoscope during the ventilation process.
**Action:** Try to start the process again by pressing the Start button. If the message recurs, press the Stop button.
**Cause:** The leak test sensor is defective or out of alignment. This causes the signal to be maintained after the block is removed.
**Action:** Report to the maintenance department for repairs.
**Cause:** The flow control air valve is contaminated or out of alignment.
**Action:** Try to start the process step again by pressing the Start button. If the error recurs, ask the maintenance service to align the valve.

## S-106: Block not pressurized or not connected

**Cause:** The endoscope is not properly connected.
**Action:** Stop the reprocessor and check if the leak test connections and the terminal block are properly placed. Connect the leak test and block again. Start the program.
**Cause:** Reprocessor fault.
**Action:** Consult the maintenance department.

## S-112, S-122, S-132, S-142, S-152, S-162, S-172: Start not allowed: Vent hookup block

These errors appear if a disinfection program is selected and the specific channel sensor is on. When this message occurs no disinfection program can be started. Stop the program and open the lid. An endoscope warning (W-764 through W-770) appears. This message must be cleared before a restart takes place.

This error occurs for the following channels:

- Air (S-112)
- Biopsy (S-122)
- Jet (S-132)
- Suction (S-142)
- Water (S-152)
- Extra (S-162)
- Elevator (S-172)

**Cause:** The endoscope channel is blocked, causing the sensor to be on.
**Action:** Disconnect the connector from the channel in the endoscope. If the message disappears, report the blocked endoscope to the maintenance department. If the message remains, see other possible causes of the error below.
**Cause:** The connection block is blocked when the endoscope is not connected.
**Action:** Disconnect the connection block and replace it with another. If the message disappears, let the maintenance department unclog the block. If the message remains, see other possible causes of the error below.

**Cause:** The channel sensor is defective or out of alignment
**Action:** Report the faulty sensor to the maintenance department.

## S-113, S-123, S-133, S-143, S-153, S-163, S-173: No flow: channel

These errors occur for the following channels indicating no fluid flow to the indicated channel:

- Air (S-113)
- Biopsy (S-123)
- Jet (S-133)
- Suction (S-143)
- Water (S-153)
- Extra (S-163)
- Elevator (S-172)

**Action:** First try the process step again by pressing the Start button. If the report recurs, press the Stop button.
**Cause:** Channel connector not connected.
**Action:** Press the Stop button and connect the endoscope. Start the program again.
**Cause:** The connector terminal block handle is not connected, or the block is out of alignment.
**Action:** Press the Stop button and open the cover. Place the terminal block and make sure that the handle is fastened in the lock pins on both sides. Start the program again.
**Cause:** An incorrect program choice was selected for the instrument.
**Action:** Check that the number of channel connections (excluding the leak test) agrees with the statement on the screen after “Parameter set.” In the case of an anomaly or doubts, stop the program and report the error directly to the system manager.
**Cause:** Wrong block.
**Action:** Check that the number of hoses on the block (excluding the leak test) is the same as the number of channel connections on the endoscope. In the case of a deviation, replace the block with the correct implementation and start the program again.
**Cause:** Too little pump pressure or the channel sensor is faulty.
**Action:** Consult the maintenance department. After restart, the channel sensor does not become high. Press the F1 or F2 buttons to see the signal units.
**Cause:** The sprayer is worn, which causes too much pressure (flow) loss along the bearing.
**Action:** A horizontal spray pattern of the leaking water can be seen with a restart. Report the error to the maintenance department.

**Cause:** The channel sensor is out of alignment.
**Action:** After restart the signal blinks too much and is unstable. Press the F1 button to signal units. Report the situation to the maintenance department for carrying out calibration.

## S-114, S-124, S-134, S-144, S-154, S-164, S-174: Blocked channel

These errors occur for the following channels indicating a blocked channel.

- Air (S-114)
- Biopsy (S-124)
- Jet (S-134)
- Suction (S-144)
- Water (S-154)
- Extra (S-164)
- Elevator (S-174)

**Action:** Try to start the process again by pressing the Start button. This can be done once. If the message recurs, the Stop button must be pressed.
**Cause:** Connection hose(s) is kinked or pinched.
**Action:** Check all hoses. If kinked or pinched, straighten out hose(s) and start the program again. If none of the hoses is kinked or pinched, see other possible causes of the error below.
**Cause:** Channel blocked.
**Action:** If the channel is blocked, have the endoscope checked or repaired. If there is no blockage, try the endoscope in a different MEDIVATORS ADVANTAGE PLUS® Pass-Thru Reprocessor. If the error is repeated, check the connection block. See other possible causes of the error below.
**Cause:** Connection block obstructed.
**Action:** Press a properly fitting hose of a small hand pump (manual leak test) in the holes on the underside of the terminal block. Squeeze the hand pump, air should come out of the channel connection. If the hookup is not obstructed, then a reprocessor fault is probably the cause. Consult the maintenance department.

## S-115, S-125, S-135, S-145, S-155, S-165, S-175: No pressure: channel

These errors occur for the following channels indicating no air flow to the indicated channel:

- Air (S-115)
- Biopsy (S-125)
- Jet (S-135)
- Suction (S-145)
- Water (S-155)
- Extra (S-165)
- Elevator (S-175)

**Cause:** There is insufficient air pressure to blow the moisture out of the channels.
**Action:** Press the Start button to try the process step again. If the message recurs, press the Stop button.
**Cause:** A hose is detached.
**Action:** Verify all hoses are still connected to the endoscope then start the program again.

**Cause:** Incorrect parameter set.
**Action:** When in doubt or if the wrong parameter is set, report the problem to the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor manager.

## S-116, S-126, S-136, S-146, S-156, S-166, S-176: Channel disconnected

This test checks the hookup connections of interconnected endoscope channels and the message is given per channel:

- Air (S-116)
- Biopsy (S-126)
- Jet (S-136)
- Suction (S-146)
- Water (S-156)
- Extra (S-166)
- Elevator (S-176)

**Cause:** There is a connector loose from the endoscope.
**Action:** If you see a loose connection, press the Stop button. Close the program, connect the loose connection, and restart the cycle.
**Cause:** It is not clear if all channels are connected.
**Action:** Try to start the process again by pressing the Start button. This may be tried once. If the message reoccurs, you must press the Stop button and call Maintenance.

## S-117, S-127, S-137, S-147, S-157, S-167, S-177: Channel disconnected

This test checks the hookup connections of small endoscope channels and the message is given per channel:

- Air (S-117)
- Biopsy (S-127)
- Jet (S-137)
- Suction (S-147)
- Water (S-157)
- Extra (S-167)
- Elevator (S-177)

**Cause:** There is a connector loose from the endoscope.
**Action:** If you see a loose connection, press the Stop button. Close the program, connect the loose connection, and restart the cycle.
**Cause:** It is not clear if all channels are connected.
**Action:** Try to start the process again by pressing the Start button. This may be tried once. If the message reoccurs, you must press the Stop button and call Maintenance.

# Reprocessing Cycle Errors

## S-200: No system air pressure

**Cause:** Insufficient air pressure is being delivered to the reprocessor.
**Action:** Ensure proper air pressure is being delivered to the reprocessor from the facility.

## S-201: Internal machine fluid leak, check drip tray

If the message report is visible, then the program cannot be stopped. After drying out, it can take 5–10 minutes before the sensor message disappears. If the sensor is released, only the program can be stopped.

**Cause:** There is liquid in the front of the reprocessor as result of a leak.
**Action:** If possible, close the water supply tap and consult the maintenance department
**Cause:** If the tray is dry, a sensor is out of alignment.
**Action:** Remove the two containers and dry the green sensor with a cloth. If the message remains, report the error to the maintenance department to have the sensor aligned, or to have the program shut down for technical service.

## S-203: Wrong connection block

The reprocessor disinfection automatically started and checked whether the reprocessor disinfection block is fitted.

**Cause:** No connection block is present:
**Action:** Place the reprocessor disinfection connection block and then press the Start button.
**Cause:** The endoscope connection block is present.
**Action:** Exchange this block for a reprocessor disinfection connection block and press the Start button.
**Cause:** The reprocessor disinfection connection block is present.
**Action:** Try pressing the Start button again. If the message recurs, then consult the maintenance department.

## S-210: Clean side door open

**Cause:** The clean side door is closed: During the program, the door sensor has failed and now indicates that the clean side door is open.
**Action:** The program can be stopped only via the expert operation. Report the error to the maintenance department to adjust the sensor, if necessary.
**Cause:** During the program the clean side door was opened.
**Action:** Close the door and press the Start button to continue the program.

## S-211: Dirty side door open

**Cause:** The dirty side door is closed: During the program, the door sensor has failed and now indicates that the dirty side door is open.
**Action:** The program can be stopped only via the expert operation. Report the error to the maintenance department to adjust the sensor, if necessary.

**Cause:** During the program the dirty side door was opened.
**Action:** Close the door and press the Start button to continue the program.

**S-222: Start not allowed: Check detergent pressure sensor**
**Cause:** The detergent sensor is out of alignment or faulty.
**Action:** Report the fault to the maintenance department.

**S-223: No detergent flow**
**Cause:** The detergent reservoir is empty.
**Action:** Check if the detergent reservoir is empty. If so, fill the reservoir. If there is sufficient detergent in the reservoir, press the Start button. If the error repeats, see the alternate cause below.
**Cause:** The detergent sensor or pump is defective.
**Action:** Report the fault to instrument service.

**S-224: Start not allowed: Detergent level low**
**Cause:** The detergent reservoir is empty.
**Action:** Check if the level of fluid in the detergent reservoir. If it is empty, fill or replace the reservoir. If there is sufficient fluid in the reservoir, press the Start button. If the error repeats, see the alternate cause below.
**Cause:** The sensor in the detergent reservoir is defective.
**Action:** Report the fault to Maintenance.

**S-244: Start not allowed: Alcohol level low**
**Cause:** The alcohol reservoir is empty.
**Action:** Check if the level of fluid in the alcohol reservoir. If it is empty, fill or replace the reservoir. If there is sufficient fluid in the reservoir, press the Start button. If the error repeats, see the alternate cause below.
**Cause:** The sensor in the alcohol reservoir is defective.
**Action:** Report the fault to Maintenance.

**S-241: Alcohol sensor defective**
**Cause:** The alcohol sensor is out of alignment or faulty.
**Action:** Report the fault to the maintenance department

**S-242: Start not allowed: Check alcohol pressure sensor**
**Cause:** The alcohol sensor is out of alignment or faulty.
**Action:** Report the fault to the maintenance department.

**S-243: No alcohol flow**
**Cause:** The alcohol reservoir is empty.
**Action:** Check if the alcohol reservoir is empty. If so, fill the reservoir. If there is sufficient alcohol in the reservoir, press the Start button. If the error repeats, see the alternate cause below.
**Cause:** The alcohol sensor or pump is defective.

**Action:** Report the fault to instrument service.

### S-266: Check drain pump

**Cause:** The basin is draining too slowly due to a faulty drain pump.
**Action:** Determine the cause of drain pump failure.

### S-271: Start not allowed: Fluid in basin

This message appears if no disinfection program is active and the level sensor is on. When this report occurs, a disinfection program cannot be started.

**Cause:** Water in the rinse basin is causing the level sensor to report liquid.
**Action:** Wait until the basin is empty. Make sure that the cover is closed so that the basin can automatically run empty.
**Cause:** The basin level sensor is faulty, causing it to remain high even though the basin is empty.
**Action:** Report the fault to instrument service for repairs.

### S-272: Start not allowed: Basin not empty

This message appears if no disinfection program is active and the basin empty sensor is on. When this message occurs, a disinfection program cannot be started.

**Cause:** Water in the basin is causing the level sensor to report liquid.
**Action:** Wait until the basin is empty. Make sure that the cover is closed so that the basin can automatically run empty.
**Cause:** The volume report on the screen is not 0, so the system is not released.
**Action:** Close the cover and wait until the message moves to zero. This may take a few minutes. If there is no effect, see the following cause below.
**Cause:** The basin empty sensor is faulty, causing it to read high when the basin is empty
**Action:** Report the fault to instrument service for repairs.

### S-273: Basin empty

**Cause:** The drain valve leaks due to contamination. The rinse basin empties during rinsing.
**Action:** Check if there is still any liquid in the basin. If the basin is empty, press the Stop button and report the fault to the maintenance department. If the basin is filled see the cause below.
**Cause:** The basin empty sensor is faulty.
**Action:** Press the Stop button and report the error to the maintenance department.

## S-274: Basin not emptying

Try the process again by pressing the Start button. If the message reoccurs, press the Stop button.

**Cause:** The drain is blocked.
**Action:** Check if the rinse basin runs empty properly. If it does not, contact the maintenance department. If it does, see the causes listed below.
**Cause:** The drain valve is faulty if the volume level does not go down.
**Action:** If the level does not go down, report the error to the maintenance department. If the level goes down, see the causes listed below.
**Cause:** The drainage hose sags which causes the rinse basin to run empty too slowly.
**Action:** Check the drainage hose. If it is sagging, report the situation to the maintenance department. If the hose does not sag, see the cause listed below.

**Cause:** The basin empty sensor is faulty.
**Action:** Report the situation to instrument service.

## S-275: Basin level dropped

**Cause:** Liquid ran out of the basin due to contamination on the valve seal.
**Action:** Report the fault to the maintenance department. If the tank is full, press the Start button to try running the program. If the tank is empty, change the tank and restart the program.
**Cause:** The drainage valve opened due to an error control.
**Action:** Report the fault to the maintenance department.
**Cause:** The rinse basin level sensor is defective or contaminated.
**Action:** Report the fault to the maintenance department.

## S-276: Basin minimum level not reached

Water must be present in the rinse basin to check for the correct connection block.

**Cause:** The drainage valve leaks.
**Action:** Press the Start button and to see if water drains from the basin. If it doesn't, contact the maintenance department. If water drains, see the cause below.
**Cause:** The basin empty sensor is defective so the control of the block is incorrectly carried out.
**Action:** Report the fault to the maintenance department.

## S-280: Flowmeter S16 has failed

**Cause:** Flowmeter S16 is seeing no water flow.
**Action:** Report the fault to the maintenance department.

## S-281: No incoming water flow

**Cause:** There is water in the rinse basin but the volume is not measured.
**Action:** Press the Stop button. Consult the maintenance department.

## S-282: Water inlet flow too high

Press the Start button to attempt to run the process step again. If the message recurs, press the Stop button.

**Cause:** The rinse basin fills too quickly because the water supply pressure is too high.

**Action:** Press the Stop button and report the situation to the maintenance department.

## S-283: Water inlet flow too low

Press the Start button to attempt to run the process step again. If the message reoccurs press the Stop button.

**Cause:** The basin fills too slowly because the water supply pressure is too low or the filter is contaminated.

**Action:** Press the Start button to continue the program and pay close attention to the water as it enters the basin. If the flow is weak, report it to the maintenance department. If the flow is normal, see the possible cause below.

**Cause:** The volume meter is contaminated or defective.

**Action:** Press the Stop button and report the situation to the maintenance department.

## S-285: No water supply

**Cause:** The water tap is closed.

**Action:** Check the water tap. If it is open, see the possible cause below. If the tap is closed, open it and press the Start button.

**Cause:** The water supply valve is defective.

**Action:** Report the situation to the maintenance department.

## S-286: Volume measurement V1>V2

**Cause:** The volume measurement and volume control indicate deviating values

**Action:** Stop the program and report the error to the maintenance service. The flow meters should be recalibrated.

## S-287: Volume measurement V1<V2

**Cause:** The volume measurement and volume control indicate deviating values

**Action:** Stop the program and report the error to the maintenance service. The flow meters should be recalibrated.

## S-288: Unrequested inlet water detected

**Cause:** The water supply valve is leaking and may dilute the disinfectant.

**Action:** Report the error to the maintenance department.

## S-289: External water supply valve failed

**Cause:** The water supply valve on the filter unit is leaking, so reprocessor disinfection cannot be performed.

**Action:** Report the error to the maintenance department.

## S-292: Basin temperature sensor defective

This error occurs independently of the software and is an extreme situation. Pressing the Stop button has no effect. Interrupting the program is only recommended after a technician has judged the situation. The program can be stopped via the expert operation. After resolving the fault, the program can be continued.

**Cause:** The temperature sensor is defective if the temperature message on the screen is higher than 100°C.
**Action:** Report the error to the maintenance department.

## S-293: Basin temperature too high

Press the Start button to start the process step again. If the message recurs, press the Stop button.

**Cause:** The drainage block is too warm after a disinfection program.
**Action:** Wait five minutes, or pour cold water in the rinse basin to see if the temperature indicated on the screen drops.

**Cause:** The setting or mixing valve is out of order, causing the supplied water to be too hot.
**Action:** Press the Stop button and check or adjust the setting of the mixing valve. Wait for a while until the water in the reprocessor has cooled down. Then start the program again.

## S-294: Basin temperature too low

Press the Start button to start the process step again. If the message recurs, press the Stop button.

**Cause:** The adjustment or mixing valve is out of order, causing the water supply to be too cold.
**Action:** Contact the maintenance department. Press the Stop button and check or adjust the mixing valve. Start the program and check if the temperature indicated on the screen is correct for the program.
**Cause:** The warm water supply is stagnated.
**Action:** Press the Stop button and consult the maintenance department.

## S-295: Water temperature sensor reading incorrectly

**Cause:** The temperature sensor is defective, the temperature sensor is reading over 100C.
**Action:** Report the fault to the maintenance department.

## S-297: Basin temperature too high

This error occurs independently of the software and is an extreme situation. Pressing the Stop button has no effect. Interrupting the program is only recommended after a technician has judged the situation. The program can be stopped via the expert operation. After resolving the fault, the program can be continued.

**Cause:** The water temperature in the rinse basin is too high.
**Action:** Stop the program and report the fault to the maintenance service.

**S-511: Measured contact time is too short**

The prescribed contact time is a sum of the time for different steps.

**Cause:** There was a change in the drain and fill time for the basin.
**Action:** Report the error to Maintenance so they can recalibrate.
**Cause:** The program parameters have been changed.
**Action:** Report the fault to the system administration.

**S-660: MRC validation failed**

**Cause:** At the end of the cycle, the operator determined the disinfectant sample failed the MRC validation test and pressed the stop button as directed.
**Action:** Replace the part A and part B containers and rerun the cycle.

**S-671: "Machine Control" Locked by the other side**

**Cause:** The reprocessor disinfection program is active. It is not possible to use this side of the reprocessor.
**Action:** Wait until the program has run completely.

**S-672: Wrong system side**

**Cause:** The reprocessor disinfection program is started from the right side rather than the left side.
**Action:** Cancel the selection from the right side and restart it on the left side.

**S-810: Check Part A container, run Replace Fluids Utility**

**Cause:** The Part A disinfectant container is empty.
**Action:** Replace empty Part A container with new Part A container and perform replace fluid utility.

**S-811: Check Part B container, run Replace Fluids Utility**

**Cause:** The Part B disinfectant container is empty.
**Action:** Replace empty Part B container with new Part B container and perform replace fluid utility.

**S-814: Part A fill sensors do not agree**

**Cause:** Both Part A fill sensors do not show the Part A reservoir is full.
**Action:** Report the fault to the maintenance department.

**S-815: Part B fill sensors do not agree**

**Cause:** Both Part B fill sensors do not show the Part B reservoir is full.
**Action:** Report the fault to the maintenance department.

**S-819: Dosing reservoir A empty sensor error**

**Cause:** The Part A fill sensor indicates fluid in the reservoir but the Part A empty sensor does not show fluid.
**Action:** Report the fault to the maintenance department.

**S-820: Part A container empty, run Replace Fluids Utility**

**Cause:** The Part A disinfectant container is empty.

**Action:** Replace empty Part A container with new Part A container and perform replace fluid utility.

**S-821: Part B container empty, run Replace Fluids Utility**

**Cause:** The Part B disinfectant container is empty.

**Action:** Replace empty Part B container with new Part B container and perform replace fluid utility.

**S-824: Dosing reservoir A not empty**

**Cause:** The Part A dosing reservoir is not empty when it should be.

**Action:** Determine the cause of the reservoir not emptying.

**S-825: Dosing reservoir B not empty**

**Cause:** The Part V dosing reservoir is not empty when it should be.

**Action:** Determine the cause of the reservoir not emptying.

**S-828: Part A dosing reservoir empty too soon**

**Cause:** Time between the Part A fill sensor going low and the Part A empty sensor going low is too short.

**Action:** Rerun the cycle and if the error continues report the fault to the maintenance department.

**S-829: Part B dosing reservoir empty too soon**

**Cause:** Time between the Part B fill sensor going low and the Part B empty sensor going low is too short.

**Action:** Rerun the cycle and if the error continues report the fault to the maintenance department.

**S-831: Air cylinder does not charge**

**Cause:** The cylinder is used to check connectivity from the endoscope to the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor. The cylinder is not filled so the check cannot be performed.

**Action:** This is the last step of the disinfection cycle. When all channels are still connected, the endoscope is properly disinfected. Visually check the connection and report the error to maintenance.

**S-832: Air cylinder not discharged**

**Cause:** The cylinder is used to check connectivity from the endoscope to the ADVANTAGE PLUS Pass-Thru Reprocessor. The cylinder cannot be vented after the check is performed.

**Action:** Report the error to maintenance.

# Control Errors (SCU)

## S-300: SCU

The report codes are as follows:

**F** = error number
**S** = step number where the error occurred in the program

After an error S-300, the phase is stopped and the program automatically goes to the post-rinse phase (a safe run down process).

**Cause:** The Safety Control (SCU) program detects an error. A sensor or valve may have had an incorrect status for a short period of time so the program was rejected as unsafe. If the fault occurred at the end of a step, the message is in the run report of the next step.
**Action:** A correct description is important for a good analysis.

- Note the codes and the text.
- Report the fault and description to the maintenance department.
- Wait until the program has stopped.
- Press the Open/Close button.
- Start a restore program.
- Restart the endoscope disinfection.

**Cause:** A computer error disrupts the program. The SCU signals the unsafe situation and sends an error message.
**Action:** Note the code and description. Evaluate if the computer is working. Report the fault and description to the maintenance department.

The possible errors are listed in the Table below:

**Table 5 S-300 Control Error Details**

| Error Number | Description | Additional Details |
|---|---|---|
| F011 | Invalid step | |
| F012 | Incorrect step | Computer software error. An active program step is not programmed into the SCU. |
| F013 | Wrong step sequence | The Stop button is pressed after a run failure. The program skipped over steps to finish the run. End the program via the Open/Close button and operator selection. |
| F014 | S14 outside cal. limits | The volume measurement is out of alignment due to contamination, a defective meter, or incorrect calibration. |
| F015 | S16 outside cal. | |
| F021 | Minimum time | LIO program step time duration deviates from SCU program control time; or an error report lasted too long before Start or Stop button was pressed. |
| F022 | Maximum time | |
| F031 | Dirty side door open (sensor) | During a disinfection program, the door sensor is off or the air valve is operated manually. A mechanical defect of either of the components can create an unsafe situation. |
| F032 | Dirty side door open (valve) | During a disinfection program, the door sensor is off or the air valve is operated manually. A mechanical defect of either of the components can create an unsafe |
| F035 | Clean side door open (sensor) | During a disinfection program, the door sensor is off or the air valve is operated manually. A mechanical defect of either of the components can create an unsafe |
| F036 | Clean side door open (valve) | During a disinfection program, the door sensor is off or the air valve is operated manually. A mechanical defect of either of the components can create an unsafe |

| | | |
|---|---|---|
| F041 | Air channel | To control flow, the relevant channel sensor must read high or low for a minimal period of time. A “high” error occurs if a pump or valve is broken or if the sensor is defective or blinks. A “low” error may be caused by a partially-blocked channel or terminal block. |
| F042 | Biopsy channel | |
| F043 | Jet channel | |
| F044 | Suction channel | |
| F045 | Water channel | |
| F046 | Extra channel | |
| F047 | Elevator channel | |

| | | |
|---|---|---|
| F051 | Basin empty | The basin empty sensor does not detect the rinse basin draining. If there is water in the basin, the sensor is defective or the drainage hose is blocked. If when adding disinfectant, the basin empty sensor does not go on, the sensor is out of alignment, is defective, or the endoscope housing is blocking the flow of disinfectant. |
| F052 | Minimum level | The basin full sensor is not activated when the basin fills. The sensor is contaminated or the water supply is too slow. During rinsing the basin full level sensor reads incorrectly due to a valve leak. |

| | | |
|---|---|---|
| F053 | Dosing reservoir A not empty | Part A dosing reservoir not emptied at end of delivery |
| F054 | Dosing reservoir B not empty | Part B dosing reservoir not emptied at end of delivery |
| F055 | Dosing reservoir A not full | Part A dosing reservoir is not full at start of delivery |
| F056 | Dosing reservoir B not full | Part B dosing reservoir is not full at start of delivery |
| F057 | Dosing pump A | Part A fill pump is on during delivery |
| F058 | Dosing pump B | Part B fill pump is on during delivery |
| F062 | Detergent | The relevant sensor is activated when it is not applicable in the step. When adding disinfectant or detergent, a message appears if the minimal dosage time is not achieved or the maximum dosage time was exceeded. |
| F072 | Detergent pump | The pump runs at the incorrect time due to a software or electronics error. |
| F073 | Channel pump | |
| F074 | Alcohol pump | Alcohol pump high during step |
| F075 | Minimum spray arm | Spray arm spinning less than 15 rpm |
| F076 | Maximum spray arm | Spray arm spinning more than 250 rpm |
| F081 | Drain valve | The valve is open at the wrong step due to a software or electronics error. |
| F082 | Water inlet | |
| F085 | Sample port(2) valve | |
| F091 | Unexpected basin volume change | The volume meter counts pulses at the wrong step, possibly due to a leaking supply valve. |
| F092 | Volume minimum | When filling the rinse basin, the measured volume is less than |

| | | |
|---|---|---|
| F093 | Volume maximum | |
| F094 | V1 > V2 | During filling the V2 meter verifies the amount measured by V1.<br>The deviation between the two meters is greater than 15%. |
| F095 | V1 < V2 | |
| F101 | Max temperature exceeded | The water is warmer than the upper limit (40°C) or colder than the lower limit (30°C). Water temperature adjustment is done externally. |
| F102 | Temperature below minimum | |
| F103 | Basin temperature | Temperature sensors differ by more than 3ºC |

**S-301: SCU in "OK" state**

**Cause:** LIO and the SCU are out of sequence.
**Action:** Rerun the cycle and if the error continues report the fault to the maintenance department.

**S-302: SCU: Wrong configuration**

The computer communicates with the SCU operation interface in the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor. This interface transmits a signal every 20 msec to check the status of the signal in and out of the computer. If this communication stops or is interrupted the error appears.

**Cause:** The safety control program found a fault in one of the electronic components or the controller is not running.
**Action:** Report the fault to the maintenance department.

**S-304: SCU: no connection**

**Cause:** A communication error occurred between the computer and the electronics drive controller.
**Action:** Safely shutdown the computer, turn off the power to the reprocessor, make certain all cables are connected to the computer, power up the reprocessor and restart the computer. Report the fault to the maintenance department.

**S-310: Spray arm speed below minimum**

**Cause:** The spray arm is not rotating or rotating below the required speed.
**Action:** Rerun the cycle and if the error continues report the fault to the maintenance department.

**S-311: Spray arm speed above maximum**

**Cause:** The spray arm is rotating faster than the required speed.
**Action:** Rerun the cycle and if the error continues report the fault to the maintenance department.

**S-350: Manual control active**

**Cause:** The manual control in the Expert screen is active and has not been released.

**Action:** Click the “release all” button on the Expert screen.

**S-360: Stopped by operator**

**Cause:** During an active program, the Stop button was pressed.

**Action:** The message is automatically stored in the run report.

# Warning Errors

## W-701: SCU: No connection

**Cause:** A communication error occurred between the computer and the electronics drive controller.
**Action:** Safely shutdown the computer, turn off the power to the reprocessor, make certain all cables are connected to the computer, power up the reprocessor and restart the computer. Report the fault to the maintenance department.

## W-702: SCU: wrong configuration

**Cause:** The Safety control program found a fault in one of the electronic components, or the controller is not in the run.
**Action:** Report the fault with number to the maintenance department.

## W-703: SCU: Incorrect status and doors inactive

**Cause:** The Safety control program rejected the previous run and blocked the cover. The doors remains closed under the following conditions:

- An error occurred during a recovery program.
- There was a power outage.
- There is a software error.
- The LIO-program shut down.
- There is an electronics error.

**Action:** The maintenance department can access the expert service to shut down the process in order to make a repair.

- Run the disinfection program to a safe situation by starting a recovery program.
- Press the Start button.
- Press the Menu button.
- Select your operator ID
- Select the program recovery after aborted program.
- Press the Start button.
- If this program is ready, then the dirty side door can be opened to safely remove the endoscope. After opening the cover, the message disappears.

## W-704: SCU: Incorrect status

**Cause:** The safety control program rejected the run.
**Action:** Open the cover so the message disappears. This takes 4 seconds. The control program is now on stand-by.

## W-705: SCU: in “OK” status

**Cause:** SCU status is OK.
**Action:** None.

## W-711: Dirty side door open

This message appears if no disinfection program is active and the door sensor is on.

**Cause:** The door is open.
**Action:** None

**Cause:** There is a door sensor defect, causing the message to appear even though the door is closed.
**Action:** Report the situation to the maintenance department for repairs.

## W-712: Dirty side door will not open

**Action:** Try to open the dirty side door by pressing the Start button.
**Cause:** The air pressure is too low to open the cover.
**Action:** Open the front service door and check the pressure gauges. Report any unusual readings.
**Cause:** The door is blocked.
**Action:** See if the blocking can be noticed visually, also on the rear side, and try if possible to remove this. If this does not work: report problem to the maintenance department.
**Cause:** A problem control valve is causing the door cylinder to malfunction.
**Action:** Report the situation to the maintenance department.

## W-713: Dirty side door will not close

**Cause:** The door is blocked.
**Action:** See if the blockage can be seen and attempt to remove it if possible. If no blockage can be seen, report the problem to the maintenance department.
**Cause**: The door sensor is defective or out of alignment.
**Action:** Consult the maintenance department.
**Cause:** The Open/Close button was pressed down too long.
**Action:** Press the button again but for a shorter time.
**Cause:** There is a defective air valve or the compressed air pressure is too low to open the door.
**Action:** Report the situation to the maintenance department.

## W-715: Basin not empty

**Cause:** The program was aborted and there is still fluid in the basin.
**Action:** Open the cover to shut down the program and automatically drain the basin.
**Cause:** There is liquid in the basin because the drain is blocked or the valve is defective.
**Action:** Check if the drain is used and report the problem to the maintenance department.
**Cause:** There is no liquid in the rinse basin. There is a basin sensor defect.
**Action:** Report the problem to the maintenance department.

**W-716: Fluid leak detected**

**Cause:** Liquid was spilled while changing chemistry.
**Action:** Remove the liquid and dry the sensor carefully. Resetting the sensor can take a few minutes.
**Cause:** While in stand-by, liquid is detected at the bottom of the reprocessor. Possible causes are leaking or a sensor set at the wrong level
**Action:** Report the situation to the maintenance department.

**W-717: No system air pressure**

**Cause:** Insufficient air pressure is being delivered to the reprocessor.
**Action:** Ensure proper air pressure is being delivered to the reprocessor from the facility.

**W-721: Water temperature sensor defective**

**Cause:** There is a temperature sensor defect if the reading is >100°C.
**Action:** Report the problem to the maintenance department.

**W-731: Clean side door is open**

**Cause:** The door is open
**Action:** None

**W-732: Clean side door will not open**

**Cause:** The air pressure is too low to open the cover.
**Action:** Open the front service door and check the pressure gauges. Report any unusual readings.
**Cause:** The door is blocked.
**Action:** See if the blocking can be noticed visually, also on the rear side, and try if possible to remove this. If this does not work: report problem to the maintenance department.
**Cause:** A problem control valve is causing the door cylinder to malfunction.
**Action:** Report the situation to the maintenance department.

**W-733: Clean side door will not close**

**Cause:** The door is blocked.
**Action:** See if the blockage can be seen and attempt to remove it if possible. If no blockage can be seen, report the problem to the maintenance department.
**Cause**: The door sensor is defective or out of alignment.
**Action:** Consult the maintenance department.

**W-743: Sensor S03 Detergent high**

**Cause:** A sensor is out of alignment or the detergent dosage system is clogged.
**Action:** Report the warning to the maintenance department.

**W-744: Sensor S17 Minimum level high**

**Cause:** There is water in the rinse basin or a sensor defect.
**Action:** Close the cover to allow the basin to run empty. Report the warning to the maintenance department.

**W-749: Sensor S24 Alcohol high**

**Cause:** A sensor is out of alignment or the alcohol dosage system is clogged.
**Action:** Report the warning to the maintenance department.

**W-751: Sensor S11 Leak test high**

**Cause:** Disinfection cycle fails or the user pushed the cancel button to end the cycle
**Action:** Open the basin door and disconnect the channel block from the channel manifold. The pressure should now be released and the warning message should disappear. Reinstall the channel block, close the basin door, and a new cycle can now be initiated.

**W-757: Sensor S33 high**

This message appears if not disinfection program is active. The warning must be cleared before a program is restarted.

**Cause:** The air cylinder sensor is out of alignment or faulty.
**Action:** Report the error to Maintenance.

**W-764, W-765, W-766, W-767, W-768, W-769, W-770: Sensor high**

This message appears when the reprocessor is idle and one of the channel sensors is high.

- Air (S-764)
- Biopsy (S-765)
- Jet (S-766)
- Suction (S-767)
- Water (S-768)
- Extra (S-769)
- Elevator (S-770)

**Cause:** The connection block is obstructed and the endoscope is not connected.
**Action:** Disengage the block. If the message disappears, report the obstructed block to the maintenance department. If the message remains see the next possible cause.
**Cause:** There is a channel sensor defect.
**Action:** Report the defective sensor to the maintenance department.

**W-800: Manual control active**

**Cause:** One or more functions are manually set. This means a disinfection program cannot be started.
**Action:** Contact the maintenance department with a request to cancel the setting.

**W-801: Purge in progress**

**Cause:** This message appears when the reprocessor is in stand-by and the reprocessor leak test system is blown through. This is an automatic routine that occurs every hour and lasts one minute.

**Action:** Wait until the message disappears and start the program.

**W-802: Venting alcohol line, close doors**

**Cause:** Alcohol lines are pressurized while unit is idle.

**Action:** Wait until venting process completes, then start cycle.

**W-803: Discharging air cylinder, close doors**

**Cause:** Air cylinder is pressurized while unit is idle.

**Action:** Wait until venting process completes, then start cycle.

**W-805: Left side controls the water line disinfect**

**Cause:** Right side cannot control the water line disinfect cycle.

**Action:** Use left side control panel to control water line disinfect cycle.

**W-810: Open door to complete cycle**

**Cause:** The program is finished. This report indicates how the program needs to be shut down.

**Action:** Press the Open/Close button and follow the instructions on the screen. After selecting the correct operator ID, the cover opens automatically and the program shuts down.

**W-820: Disinfectant in the basin (doors locked)**

**Cause:** The water line disinfect cycle failed while disinfectant was in the basin.

**Action:** Restart the water line disinfect cycle.

**W-821: Disinfectant in the supply line (doors locked)**

**Cause:** The water line disinfect cycle failed while disinfectant was in the water supply lines.

**Action:** Restart the water line disinfect cycle.

# CHAPTER 7

## SYSTEM ADMINISTRATION

This chapter is meant for Administrative Use Only. It shows the System Administrator how to setup and manage all process-specific data, along with the daily operations of the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor and programs. The System Administrator must have a strong background in computers and Windows Operating Software. If you are uncertain of how to proceed, contact Medivators Technical Support for assistance.

# ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor Software

The ADVANTAGE PLUS Pass-Thru Reprocessor software consists of two main programs:

- **LIO** (Logic Input/Output) is the program operators use to communicate with the ADVANTAGE PLUS Pass-Thru Reprocessor. The software also controls the reprocessor and the disinfection processes.
- **Management** is the ADVANTAGE PLUS Pass-Thru Reprocessor database for user and cycle run information. The system administrator has access to input data, process reports, and manage multiple ADVANTAGE PLUS Pass-Thru Reprocessors. This program runs on only one computer, usually a server of the ADVANTAGE PLUS Pass-Thru Reprocessor.

## Nurse Manager Login

The ADVANTAGE PLUS Pass-Thru Reprocessor database can only be accessed using a Nurse Manager account. A Nurse Manager account is created during ADVANTAGE PLUS Pass-Thru Reprocessor installation. A Nurse Manager can add and update:

- Users
- Physicians/Assistants
- Endoscopes
- Modify and create parameter sets
- Modify non-critical system parameters

**To login as a Nurse Manager:**

Launch the Management program by double clicking on the Management shortcut in the ADVANTAGE PLUS Pass-Thru Reprocessor folder on the computer desktop.

1. When the authorization window appears, click on the down arrow to select your Login name.

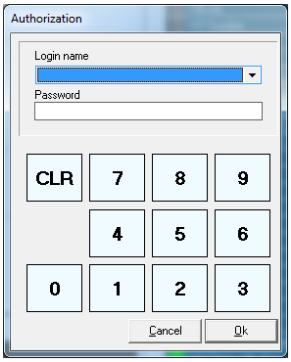


**Figure 63 Authorization Window**

2. Enter your numeric password. Press the CLR button if you make an entry error and want to re-enter the password.
3. Press the OK button to complete your password entry and continue on to the Management program.

**Note:** To prevent unauthorized access to the Management program, close the program when you have finished your work.

Under special circumstances, a temporary password can be issued to login as a System Administrator. Contact technical service to describe the problem. If you receive a password, it will be valid only for the date it was granted and only for specific applications.

# Management Program

## Structure

The Management program is subdivided into general and configuration applications. These are available as tabs on the management screen.

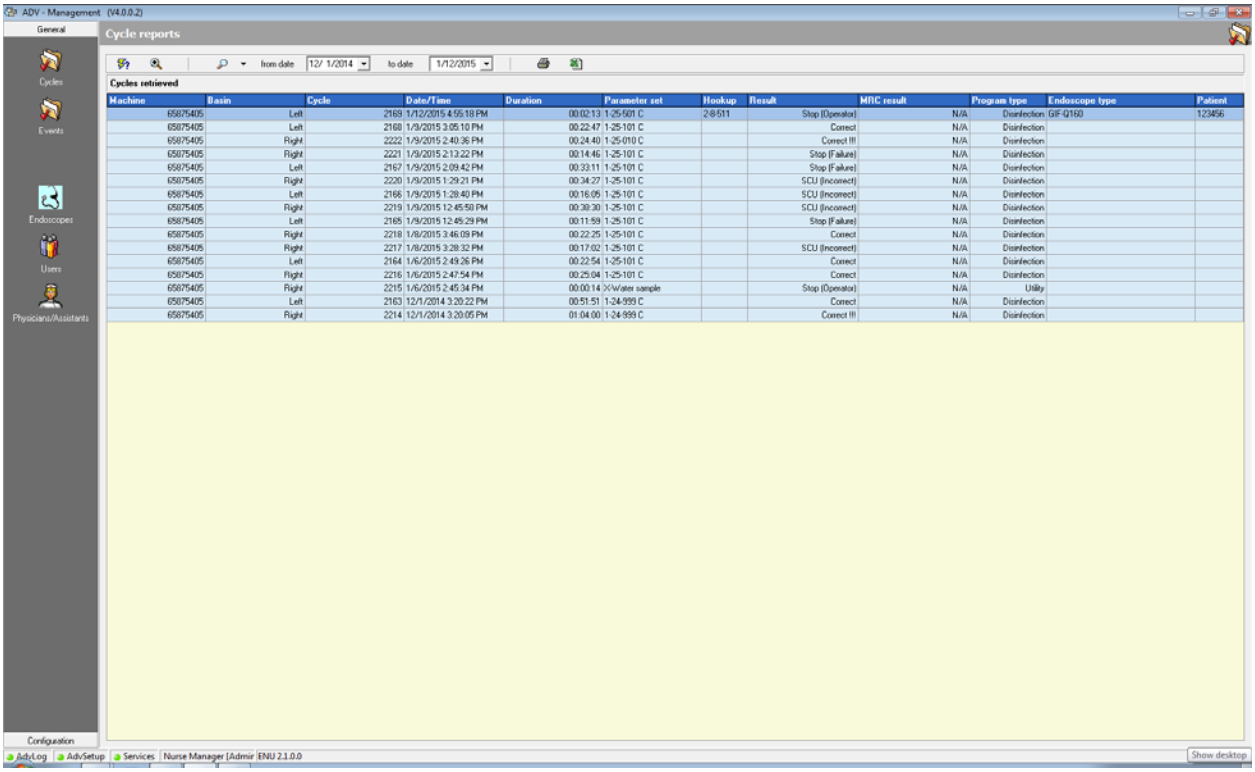



**Figure 64 Management Screen**

## General Applications

There are five general applications:

1. **Cycles** collects information from the disinfection programs. Specific data can be called up from the database with the sort and search options.
2. **Events** gather data for fluid changes.
3. **Endoscopes** maintain data relating to instruments and endoscopes.
4. **Users** store data on ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor operators and other authorized personnel who may work with the ADVANTAGE PLUS Pass-Thru Reprocessor or any peripheral hardware or software.
5. **Physician/Assistants** is a database used to identify physicians and other medical personnel who use endoscopes for patient examinations.

## Configuration Applications

There are two configuration applications:

1. Programs provides an overview of the programs and the relevant settings.
2. Systems is where all reprocessor settings are entered. These settings are mostly for maintenance and calibration.

## Setup

The Management software is delivered with many base settings already established. However, before the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor can be released for use, the Nurse Manager or service technician must enter customer-specific data for the following:

- Endoscopes
- Users
- Physicians/Assistants

The Nurse Manager is the one who enters user names, access levels, and sets the passwords which are distributed to other users. It is the Nurse Managers responsibility to keep the passwords confidential to protect the data and to meet all legal obligations.

## Navigation

The name of a button usually appears if the mouse point is placed over it. Information on the function of buttons unique to the program is described below.

- **Select**: Press the arrow at the top right of a list to selection from a drop-down list.
- **Sort**: Sort the information in any column by pressing the arrow at the top right of the column. By pressing the arrow again, the sequence is reversed. For example, sort alphabetically A to Z, or Z to A.
- **Export**: Send a copy of the data to the export folder.
- **Import**: Retrieve stored data from another location.
- **Print**: To print specific lists from various applications, press the Print button. Properties and settings are specific for your printer. See your printer user manual for additional information.

**Caution** Importing or modifying data may result in its loss. Backup your data regularly and verify that only one management application is active when data is modified.

### Barcodes

The ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor is supplied with a set of barcode labels to be used with the endoscopes, operators, physicians and assistants.

The barcode label mounted on the endoscope should be placed on the control head handle on the knob side so the barcode is visible when endoscope is place in the basin. Before the barcode label is attached to the endoscope clean the surface of the endoscope with alcohol and dry.

The barcode label for the operator can be placed on the operator's ID badge.

The supplied set is numbered 100 to 199 and includes 2 barcode labels per number. Duplicate barcode labels can be ordered with part number 67199-157. Additional barcode number sets are available, see Appendix B.

## Endoscope Entry

The ADVANTAGE PLUS Pass-Thru Reprocessor has different programs for different types of endoscopes. The objective is to monitor those channels that are connected. Each endoscope requires a specific hookup and a specific parameter set. Refer to the MEDIVATORS Hookup Lookup guide on the Medivators website (www.medivators.com/hookuplookup/) to identify the correct hookup block to use for the endoscope to be reprocessed.

**WARNING Failure to use the correct hookup and parameter set can result in an endoscope that is not disinfected properly and therefore should not be used on a patient. If you are uncertain about the correct channel setup of an endoscope, call technical support for assistance.**

### Endoscope Entry Data Fields

#### Endoscopes Field:

- **Code** is a unique number used for system identification.
- **Endoscope Type** is the model number of the endoscope.
- **Hookup** is the part number for the hookup used with the endoscope.
- **Brand** is the name of the endoscope manufacturer.
- **Barcode** number assigned to the endoscope.
- **Type Number** is the model number of the endoscope.
- **Serial Number** is the manufacturer-assigned identification number on the endoscope.
- **Internal ID** is the hospital identification number for the endoscope. The internal ID is printed on the cycle log.

- **Tag ID** is not used.
- **Status** indicates whether the endoscope is in service or out of service.
- **Memo** is a field where extra information can be entered as text.

**Endoscope types Field:**

- **Endoscope type** is the model number of the endoscope.
- **Number of channels** is the number channel connections on the endoscope.
- **Leak test** is the number of leak test connections on the endoscope.
- **Hookup** is the part number for the hookup used with the endoscope.

**Parameter sets Field:**

**Parameter set** is the parameter set assigned to the selected endoscope type.
**Parameter set comment** user entered written description of the parameter set.

**Note**: There is no Save button. Data is saved only if you click or move the cursor to another field in the list.

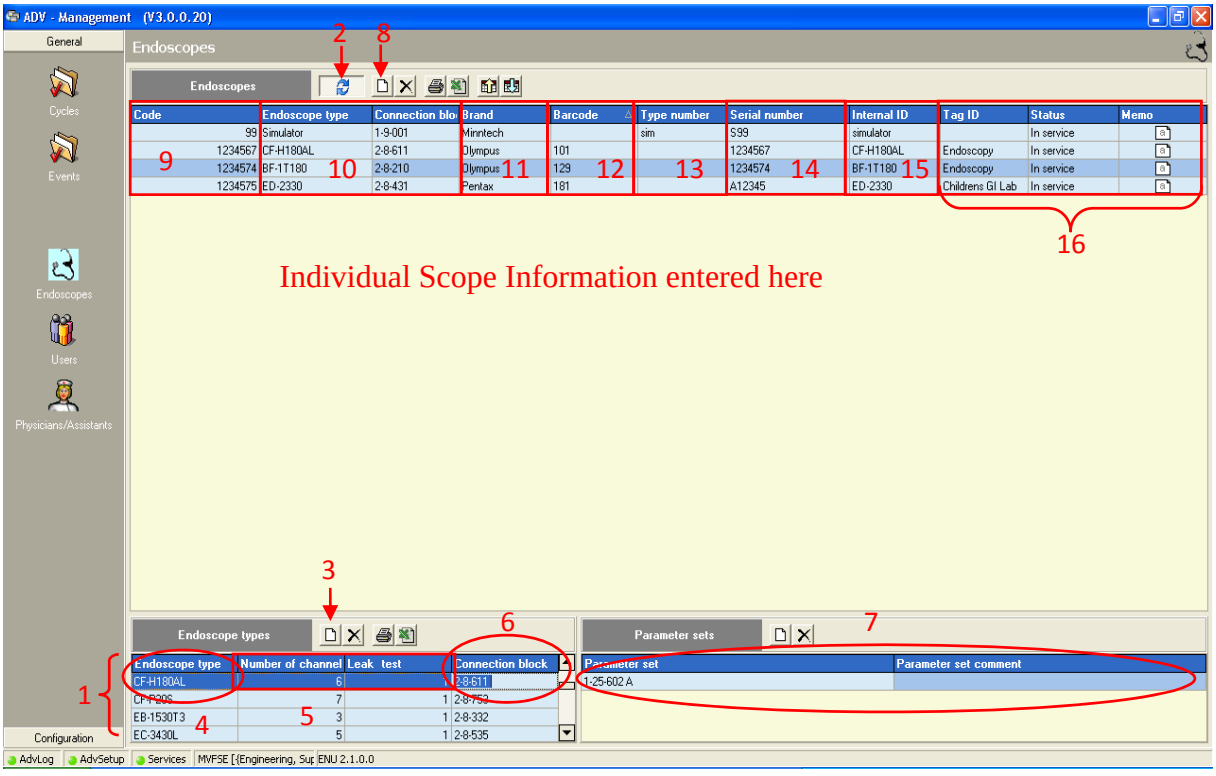



**Figure 48 Endoscope Entry**

## Adding Endoscope Types

Before entering the information for individual endoscopes, the **Endoscope types** must be listed.

1. First, check to see if the scope model/type is listed under **Endoscope type**. If not, then it must be entered by:
2. Click on the **Edit On/Off** button next to **Endoscopes** at the top of the page to enable or turn-on editing.
3. Click on the **New** button next to **Endoscope type's** window at the lower left of the screen. An empty input line appears.
4. Place the cursor in the **Endoscope type** field and type in the scope model number (i.e. CF-H180AL).
5. Move the cursor to the next field and enter the **Number of channels**. This is obtained from parameter set found in the hookup guide (1-25-**6**02 has **6** channels). Move the cursor to the **Leak test** field and enter the number of leak test connections, in most cases it is 1.
6. Move the cursor to the **Connection Block** field and enter connection or hookup block needed for the scope mode listed. NOTE: For Connection block and Parameter sets: Reference the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor Hookup Application Guide.
7. Select the **Parameter set** from the drop down list, obtained from the hookup guide. A brief description can be entered in the **Parameter set comment** field, if desired.

## Adding New Endoscopes

Information for a new endoscope is entered into the ADVANTAGE PLUS Pass-Thru Automated Endoscope Reprocessor as follows:

Ensure the **Edit On/Off** button (**#2**) at the top of the page is "pushed" or "on" to enable editing.

8. Click on the **New** button next to the **Endoscopes** section. An empty input line appears.
9. Place the cursor in the **Code** field and enter a code for the scope. **Note**: This field cannot be left blank, must be unique and all numbers. The serial number can be used without the alpha characters.
10. Move the cursor to the **Endoscope type** field and select scope type from the pull-down menu. Then the connection block field will auto populate.
11. Type in the Endoscope **Brand**, if desired.
12. Enter the barcode number applied to the scope.
13. The Endoscope model number can be re-entered in the **Type number** field.
14. Enter the scope's serial number in the **Serial number** field.
15. In the **Internal ID** field enter the facility's scope inventory number or serial number. This field MUST be filled in.

16. The **Tag ID, Status and Memo** fields that can be used as needed to make notes about each scope.
17. In order to save any data you have just entered, click on another scope entry in the list. Enter as many scopes as needed, remembering to click on another line at the end of each entry to save the information entered. This also must be done when editing scope information as well.

## Dual Endoscope Entry

The ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor has the ability to reprocess two scopes per basin but is limited by the type of scope it can reprocess dually. Examples of types of scopes that can be reprocessed dually are: Bronchoscopes, Laryngoscopes, and Cystoscopes. Up to four dilators or soak only items can be reprocessed per basin. In order to reprocess two scopes at a time a dual scope hookup and parameter set are required. Use the MEDIVATORS Hookup Lookup at www.medivators.com to determine the proper hookup and parameter set. You are required to reprocess two scopes with the dual scope hookup, to run a single scope a single scope hookup is required.

Here are some rules for the dual scope option:

- If a scope type is defined as 0 channels and the hookup is a **2-8-001** or **2-8-002** or the hookup begins with 5, LIO will prompt for up to 4 scopes/devices. (dilators, soak only devices)
- If a scope type is defined as 1 channel and 0 leak test and hookup begins with 5, LIO will prompt for up to 4 scopes. (dilators)
- If a scope type is defined as 1 or 2 channels and 1 leak test and hookup begins with 5, LIO will prompt for 2 scopes

**Note:** Dual scope hookups start with 5 (i.e. 5-8-112). Dual scope parameter sets start with 2 (i.e. 2-25-101).

The dual scope and hookup barcode options need to be turned on in the System Parameters in Management.

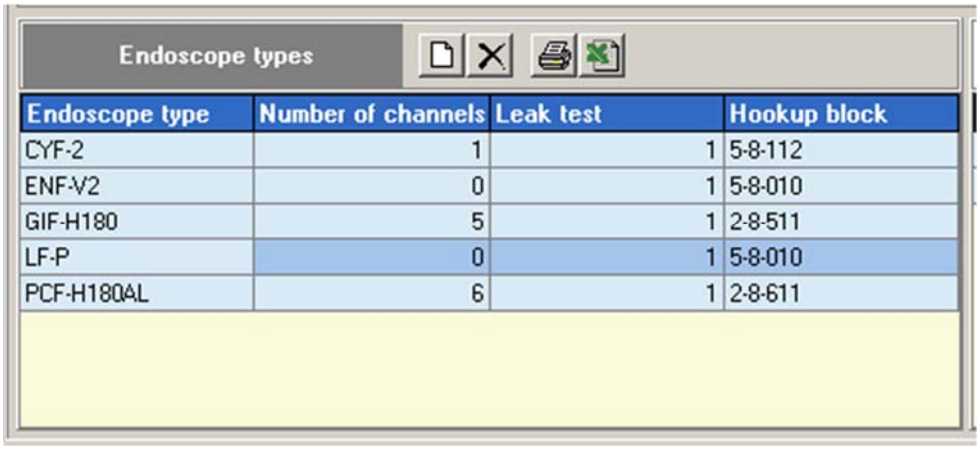
To enter scopes into Management follow these steps:

1. Gather the scope information, here is an example:

| Endoscope Model | Serial number | Dual Hookup | Parameter-Single | Parameter-Dual |
|---|---|---|---|---|
| CYF-2 | 2001234 | 5-8-112 | 1-25-101 | 2-25-101 |
| CYF-2 | 2004567 | 5-8-112 | 1-25-101 | 2-25-101 |
| ENF-V2 | 2006789 | 5-8-010 | 1-25-010 | 2-25-010 |
| ENF-V2 | 2011234 | 5-8-010 | 1-25-010 | 2-25-010 |
| LF-P | 2014567 | 5-8-010 | 1-25-010 | 2-25-010 |

| | | | | |
|---|---|---|---|---|
| LF-P | 2017890 | 5-8-010 | 1-25-010 | 2-25-010 |

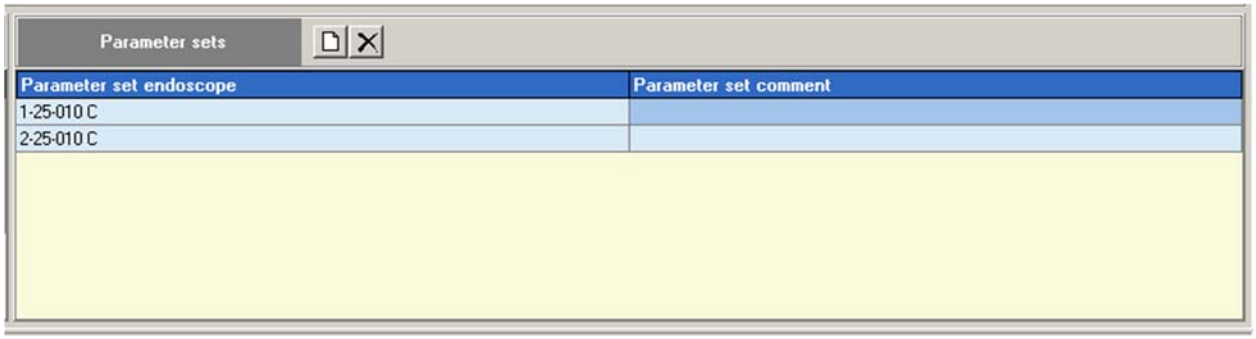
2. Open the **Management** application and proceed to the Endoscope entry portion of the application.
3. Under **Endoscope types** enter the endoscope model, number of channels, leak test and the hookup block number for the dual scope hookup.




| Endoscope type | Number of channels | Leak test | Hookup block |
|---|---|---|---|
| CYF-2 | 1 | 1 | 5-8-112 |
| ENF-V2 | 0 | 1 | 5-8-010 |
| GIF-H180 | 5 | 1 | 2-8-511 |
| LF-P | 0 | 1 | 5-8-010 |
| PCF-H180AL | 6 | 1 | 2-8-611 |

**Figure 66 Endoscope Types**

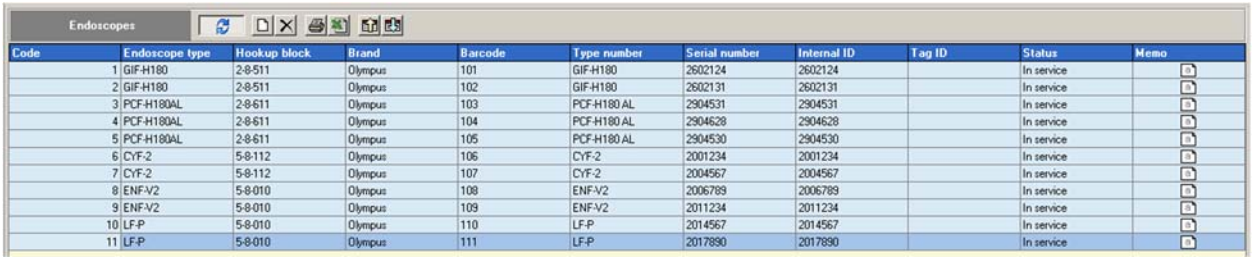
4. Under **Parameter sets** enter both the single and dual parameter sets.




| Parameter set endoscope | Parameter set comment |
|---|---|
| 1-25-010 C | |
| 2-25-010 C | |

**Figure 67 Parameter Sets**

5. Enter the individual scope information to the **Endoscopes** list.




| Code | Endoscope type | Hookup block | Brand | Barcode | Type number | Serial number | Internal ID | Tag ID | Status | Memo |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | GIF-H180 | 2-8-511 | Olympus | 101 | GIF-H180 | 2602124 | 2602124 | | In service | |
| 2 | GIF-H180 | 2-8-511 | Olympus | 102 | GIF-H180 | 2602131 | 2602131 | | In service | |
| 3 | PCF-H180AL | 2-8-611 | Olympus | 103 | PCF-H180 AL | 2904531 | 2904531 | | In service | |
| 4 | PCF-H180AL | 2-8-611 | Olympus | 104 | PCF-H180 AL | 2904628 | 2904628 | | In service | |
| 5 | PCF-H180AL | 2-8-611 | Olympus | 105 | PCF-H180 AL | 2904530 | 2904530 | | In service | |
| 6 | CYF-2 | 5-8-112 | Olympus | 106 | CYF-2 | 2001234 | 2001234 | | In service | |
| 7 | CYF-2 | 5-8-112 | Olympus | 107 | CYF-2 | 2004567 | 2004567 | | In service | |
| 8 | ENF-V2 | 5-8-010 | Olympus | 108 | ENF-V2 | 2006789 | 2006789 | | In service | |
| 9 | ENF-V2 | 5-8-010 | Olympus | 109 | ENF-V2 | 2011234 | 2011234 | | In service | |
| 10 | LF-P | 5-8-010 | Olympus | 110 | LF-P | 2014567 | 2014567 | | In service | |
| 11 | LF-P | 5-8-010 | Olympus | 111 | LF-P | 2017890 | 2017890 | | In service | |

**Figure 68 Individual Scope Entry**

**Running a cycle with dual endoscopes:**

Once the information is entered in Management the endoscopes can be reprocessed. After selecting Endoscopes in the Main Menu in LIO, the operator first will be prompted to scan the barcode on the hookup. Note that there are two hookup options for the scopes that can be reprocessed dually. This gives the option of either reprocessing the scopes either singularly or dually.

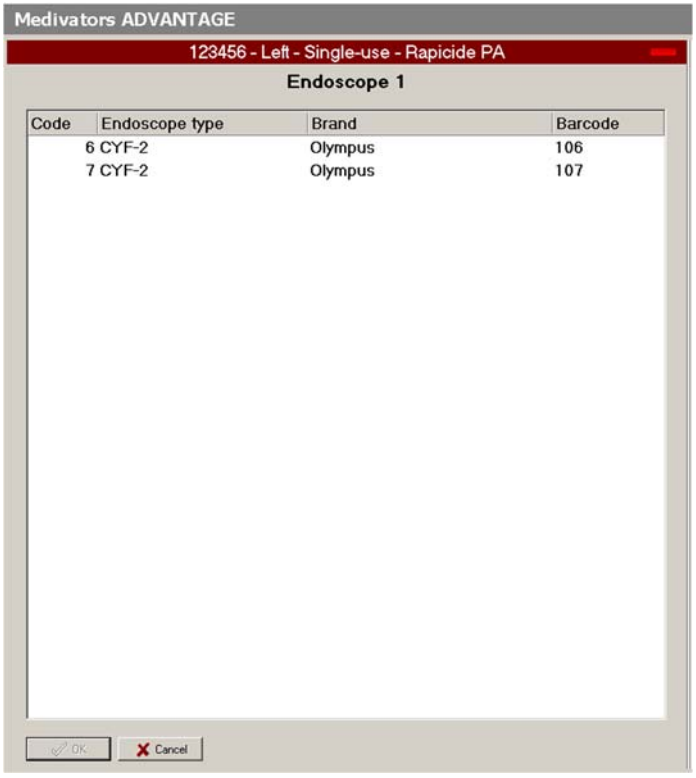



**Figure 69 Endoscope Selection**

If a dual scope hookup is selected the operator will be prompted to select the first scope off the list of available scopes.

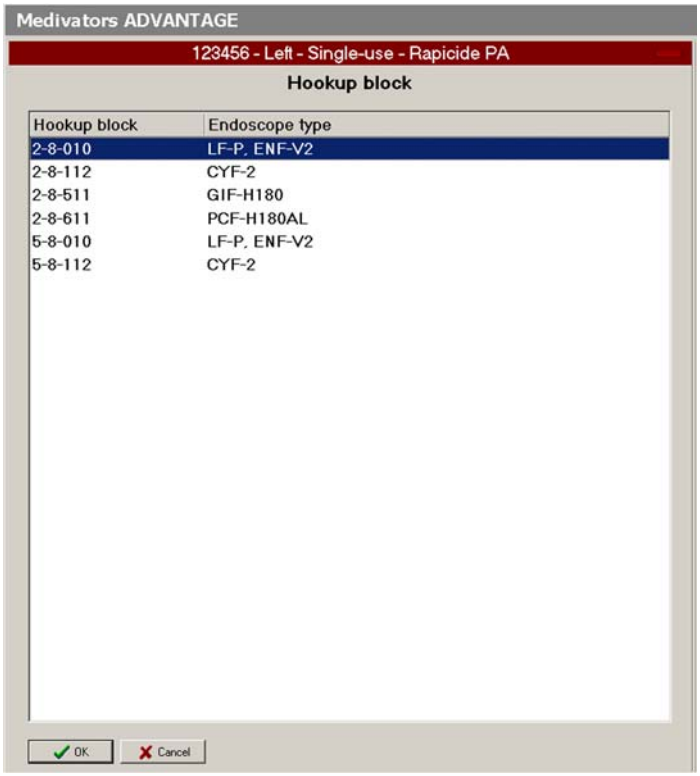



**Figure 70 Hookup Selection**

The operator will then be prompted to select the second scope off of the list of available scopes.

# Users Entry

Users are the people who have access to the system data and operate the ADVANTAGE PLUS® Pass-Thru Reprocessor. For security and data protection, operator access is limited to specific programs and functions.

## Users Entry Data Fields

For each user the following data can be entered:

- **Name** is the user's name.
- **Login** is the user's login.
- **Group** assigns the level of access to the system.
- **Bar Code** number assigned to the user.
- **Tag ID** is not used.
- **Personnel Code** can be used to enter the user's employee number or other ID (not required).
- **Password** can be assigned to a user to protect that user's login (not required).

**Note**: Passwords consist of numbers only.

## User Groups

User groups are set up to establish access rights for different types of operators. The following groups are standard:

- **Operator, Hospital:** Daily operator.
- **Nurse Manager, Hospital:** System manager able to add to and update endoscopes, users, etc.
- **Administrator, Hospital:** System manager able to update endoscopes, users, etc.
- **Maintenance, Hospital:** Hospital technicians and maintenance.
- **Supervisor, Hospital:** System manager able to only view information.
- **Engineering, Supplier:** Supplier system management
- **Maintenance, Supplier:** Field technician
- **Production, Supplier:** Manufacturer production personnel

Operator, Hospital and Nurse Manager, Hospital are the two most commonly used user groups. User groups and User rights are preloaded and do not require any further management.

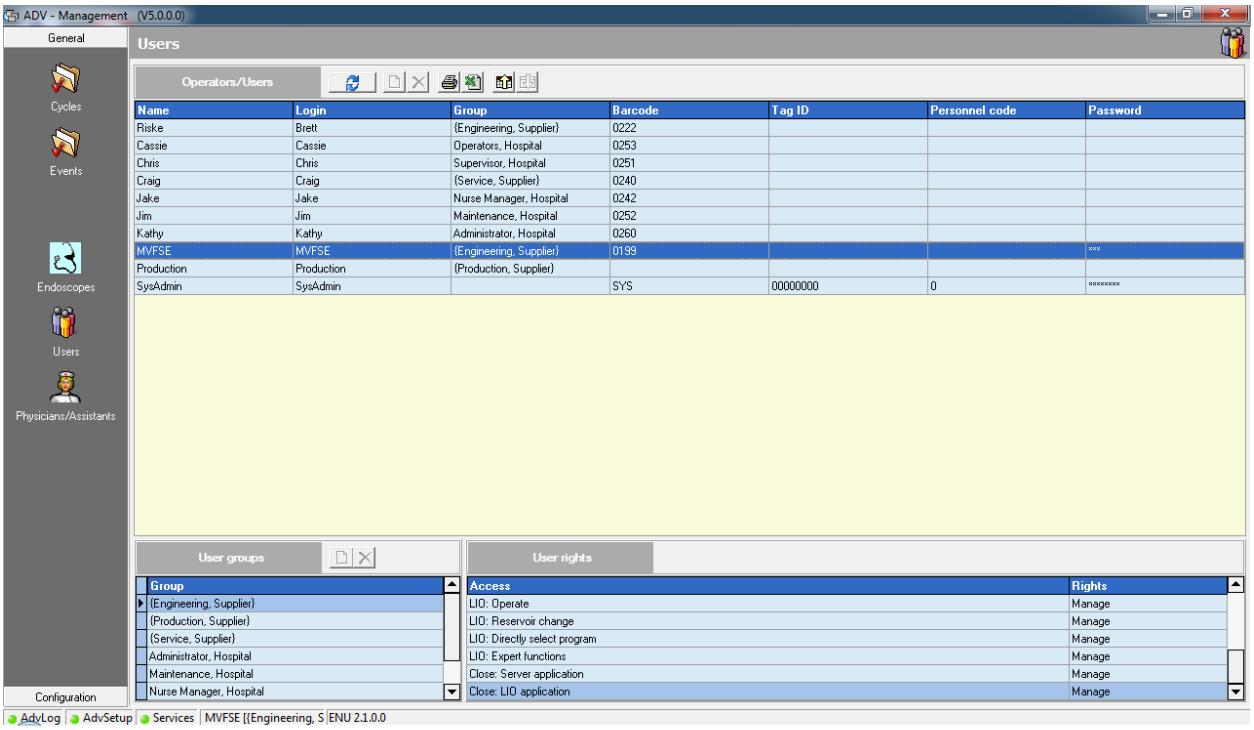

ADV - Management (V5.0.0.0)
General
Cycles
Events
Endoscopes
Users
Physicians/Assistants
Configuration
Users
Operators/Users
Name | Login | Group | Barcode | Tag ID | Personnel code | Password
Riske | Brett | {Engineering, Supplier} | 0222
Cassie | Cassie | Operators, Hospital | 0253
Chris | Chris | Supervisor, Hospital | 0251
Craig | Craig | {Service, Supplier} | 0240
Jake | Jake | Nurse Manager, Hospital | 0242
Jim | Jim | Maintenance, Hospital | 0252
Kathy | Kathy | Administrator, Hospital | 0260
MVFSE | MVFSE | {Engineering, Supplier} | 0199 | ***
Production | Production | {Production, Supplier}
SysAdmin | SysAdmin | | SYS | 00000000 | 0 | ********
User groups
Group
{Engineering, Supplier}
{Production, Supplier}
{Service, Supplier}
Administrator, Hospital
Maintenance, Hospital
Nurse Manager, Hospital
User rights
Access | Rights
LIO: Operate | Manage
LIO: Reservoir change | Manage
LIO: Directly select program | Manage
LIO: Expert functions | Manage
Close: Server application | Manage
Close: LIO application | Manage
AdvLog | AdvSetup | Services | MVFSE [{Engineering, S | ENU 2.1.0.0

**Figure 71 The Users Screen**

## Adding a New User

To add a new user, follow these steps:

1. Click on the **Edit** icon to enable editing.
2. Click on the **Add** button to add an empty record at the top of the list.
3. Position the cursor in the first field and enter the appropriate information.
    - **Name**: Complete user name.
    - **Login**: Login in name
    - **Group**: Select the appropriate group for this user.
    - **Barcode**: Barcode number for identification system.
    - **Tag ID**: Not used.
    - **Personal Code**: Employee number, bar code number, or other ID.
    - **Password**: Personal access code.
4. Click on another line to save the data.
5. When completed, click on the **Edit** Icon to disable editing.

### Changing User Data

To modify user data, follow these steps:

1. Click on the **Edit** icon to enable editing.
2. Select the field to be changed and enter the new information.
3. Click on another line to save the data.
4. Click on the **Edit** icon to disable editing.

### Deleting User Data

To delete a user profile, follow these steps:

1. Click on the **Edit** Icon to enable editing.
2. Select the line to be deleted in the overview list.
3. Click on the **Delete** button.
4. When a confirmation window opens, click **OK** to delete the user, or click **Cancel** to go back without deleting the information.
5. Click on the **Edit** Icon to disable editing.

# Physician/Assistants Entry

Under Physician/Assistants are listed the people who have a connection to the patient and endoscope, but who are not actively involved in the disinfection process. Because they do not operate the reprocessor they have no user rights on the system.

## Physicians/Assistants Entry Data Fields

For the doctor or assistant the following data can be entered:

- **Internal ID** such as employee number, other ID, or name.
- **Name** of the physician or assistant.
- **Bar Code** number assigned to the physician or assistant.
- **Type** select Physician or Assistant

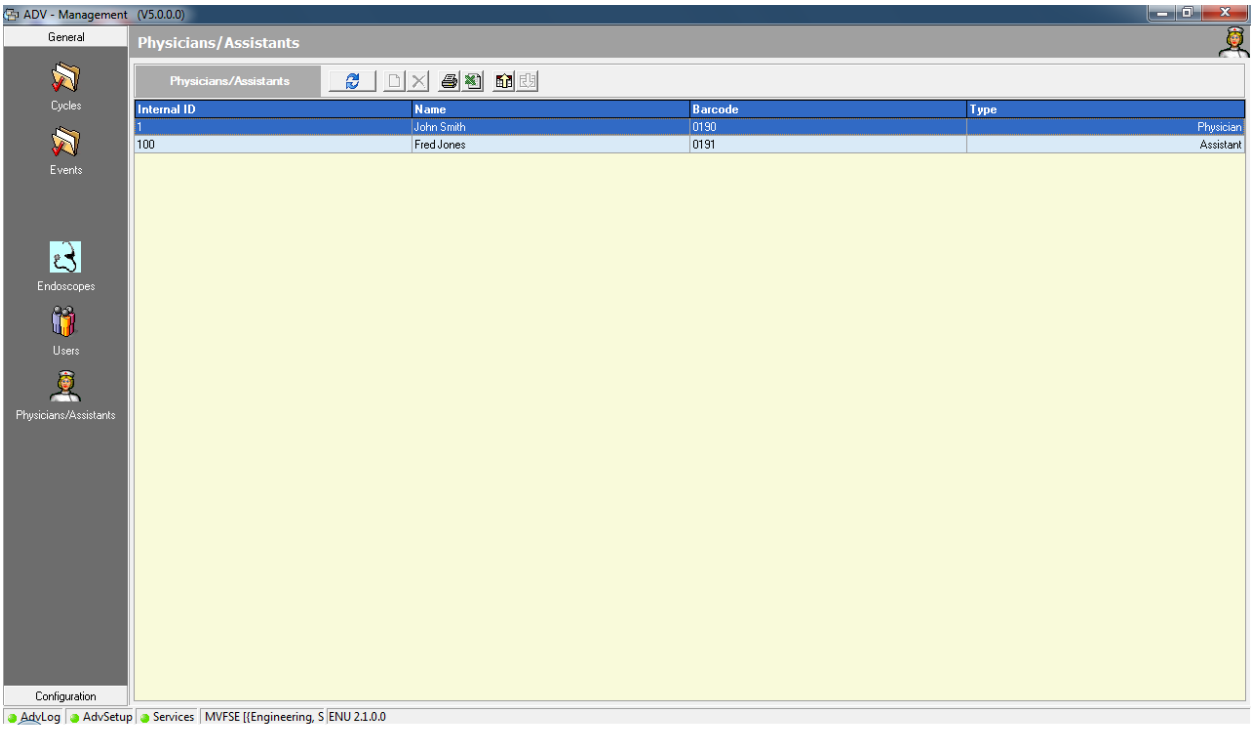



**Figure 72 Physician and Assistant Screen**

## Adding Physician Information

Physician and Assistant information is entered by doing the following:

1. Click on the **Physician/Assistants** icon on the left side of the screen.
2. Click on the **Edit** icon at the top of the window if editing is turned off.
3. Click on the **New** button at the top of the window. A new, empty input line appears.
4. Place the cursor in the **Internal ID** field and enter the appropriate information.
5. Continue to enter data in the fields.
6. In the **Type** field, click on the arrow mark and select Physician or Assistant.

## Changing Physician Information

To modify user data, follow these steps:

1. Click on the **Edit** icon to enable editing.
2. Select the field to be changed and enter the new information.
3. Click on another line to save the data.
4. Click on the **Edit** icon to disable editing.

### Deleting Physician Information

To delete a profile, follow these steps:

1. Click on the **Edit** Icon to enable editing.
2. Select the line to be deleted in the overview list.
3. Click on the **Delete** button.
4. When a confirmation window opens, click **OK** to delete the user, or click **Cancel** to go back without deleting the information.
5. Click on the **Edit** Icon to disable editing.

# Reports

## Introduction

By clicking on the **Cycles** icon on the left side of the Management General window, program data can be called up. The information is based on the cycles run and data entered. For each disinfection program run, the following data is recorded and stored on the computer hard drive:

- Reprocessor serial number
- Basin
- Run number
- Date and time
- Hookup used
- Cycle result
- Disinfectant temperature
- Disinfectant contact time
- Program run
- Operator Load ID
- Operator Unload ID
- Endoscope model
- Endoscope serial number
- Patient ID (optional)
- Physician (optional)
- Assistant (optional)
- Process step times
- Errors
- Disinfectant MRC Pass/Fail

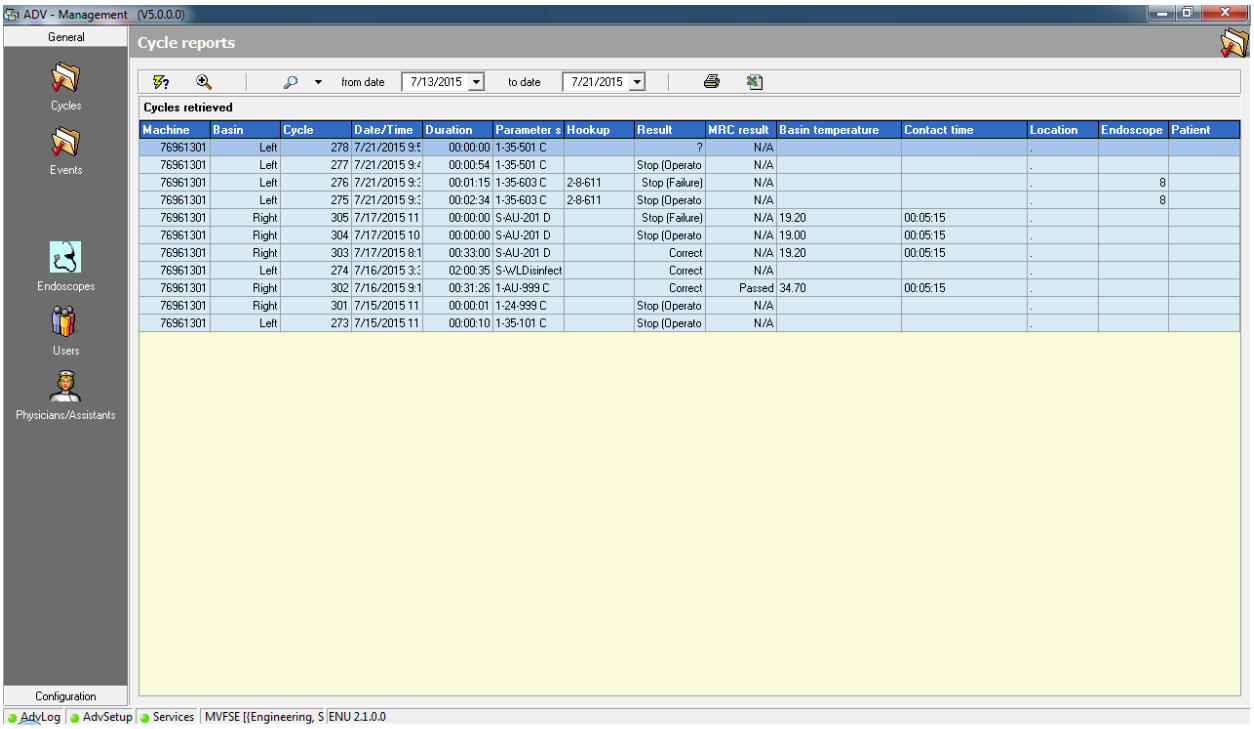

ADV - Management (V5.0.0.0)
General
Cycles
Events
Endoscopes
Users
Physicians/Assistants
Configuration
Cycle reports
from date
7/13/2015
to date
7/21/2015
Cycles retrieved
Machine Basin Cycle Date/Time Duration Parameter s Hookup Result MRC result Basin temperature Contact time Location Endoscope Patient
76961301 Left 278 7/21/2015 9:5 00:00:00 1-35-501 C ? N/A
76961301 Left 277 7/21/2015 9:4 00:00:54 1-35-501 C Stop (Operato N/A
76961301 Left 276 7/21/2015 9:3 00:01:15 1-35-603 C 2-8-611 Stop (Failure) N/A 8
76961301 Left 275 7/21/2015 9:3 00:02:34 1-35-603 C 2-8-611 Stop (Operato N/A 8
76961301 Right 305 7/17/2015 11 00:00:00 S-AU-201 D Stop (Failure) N/A 19.20 00:05:15
76961301 Right 304 7/17/2015 10 00:00:00 S-AU-201 D Stop (Operato N/A 19.00 00:05:15
76961301 Right 303 7/17/2015 8:1 00:33:00 S-AU-201 D Correct N/A 19.20 00:05:15
76961301 Left 274 7/16/2015 3:3 02:00:35 S-WLDisinfect Correct N/A
76961301 Right 302 7/16/2015 9:1 00:31:26 1-AU-999 C Correct Passed 34.70 00:05:15
76961301 Right 301 7/15/2015 11 00:00:01 1-24-999 C Stop (Operato N/A
76961301 Left 273 7/15/2015 11 00:00:10 1-35-101 C Stop (Operato N/A
AdvLog
AdvSetup
Services
MVFSE [{Engineering, S
ENU 2.1.0.0

**Figure 73 Cycle Reports Screen**

## Selecting Report Criteria

### Time Period Selection

Narrow down your search criteria by gathering data from a specific time period.

1. With buttons “**from date**” and “**to date**” select the dates for your report. Click on the arrow key to the right of each date window.
2. Select the desired start and end dates from the calendars that pop up.
3. Press the **Run** button to run the report.

### Narrow Criteria

The overview report is easier to read if it is shorter and more concise. To narrow or filter your search criteria:

1. Press the arrow key beside the Filter button, and chose the desired selection in the menu.

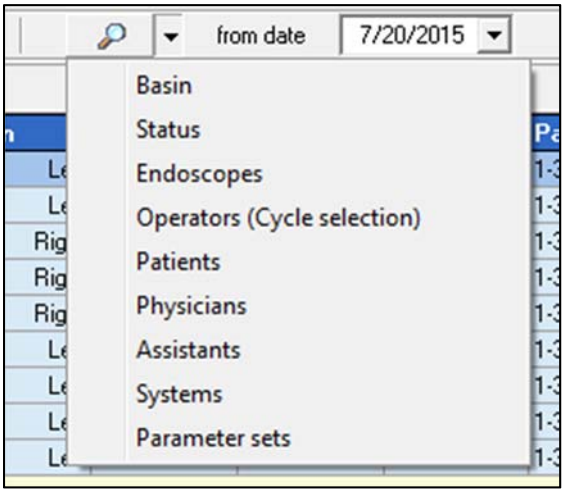



**Figure 74 Criteria Search Pull Down**

2. In the window that opens, chose the selections which you want displayed.
3. Press the **Run** button to run the report

For the status selection, for example, you can choose the following items.

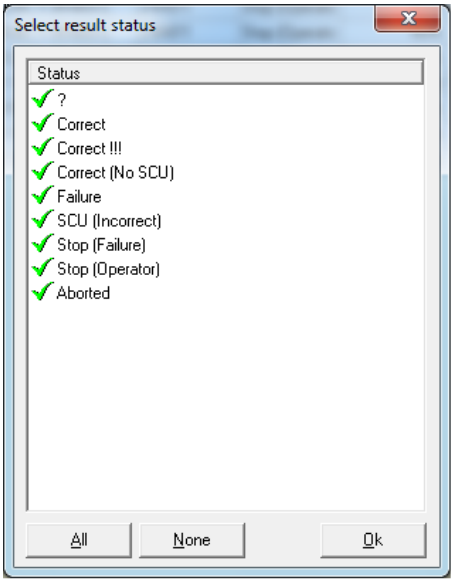



**Figure 75 Criteria Search Selection**

1. Double click on an item to select it or to cancel the selection.
2. Press **OK** and **Run** to run the report.

A selection can be made from:

- Assistants
- Patients
- Endoscope code
- Physicians
- Operators
- Run status
- Parameters
- Systems

## Run Report

By pressing the Run Report button, the report overview is set up and the report is shown on the screen.  Click on the upper blue bar to sort the list in the appropriate column. Click again to reverse the selection.  The data of each run goes horizontally by line.  Double click on a line if more information is desired. The screen run details are displayed.

### Cycle Details

In the Run Details field, a number of columns are included with specific run data.

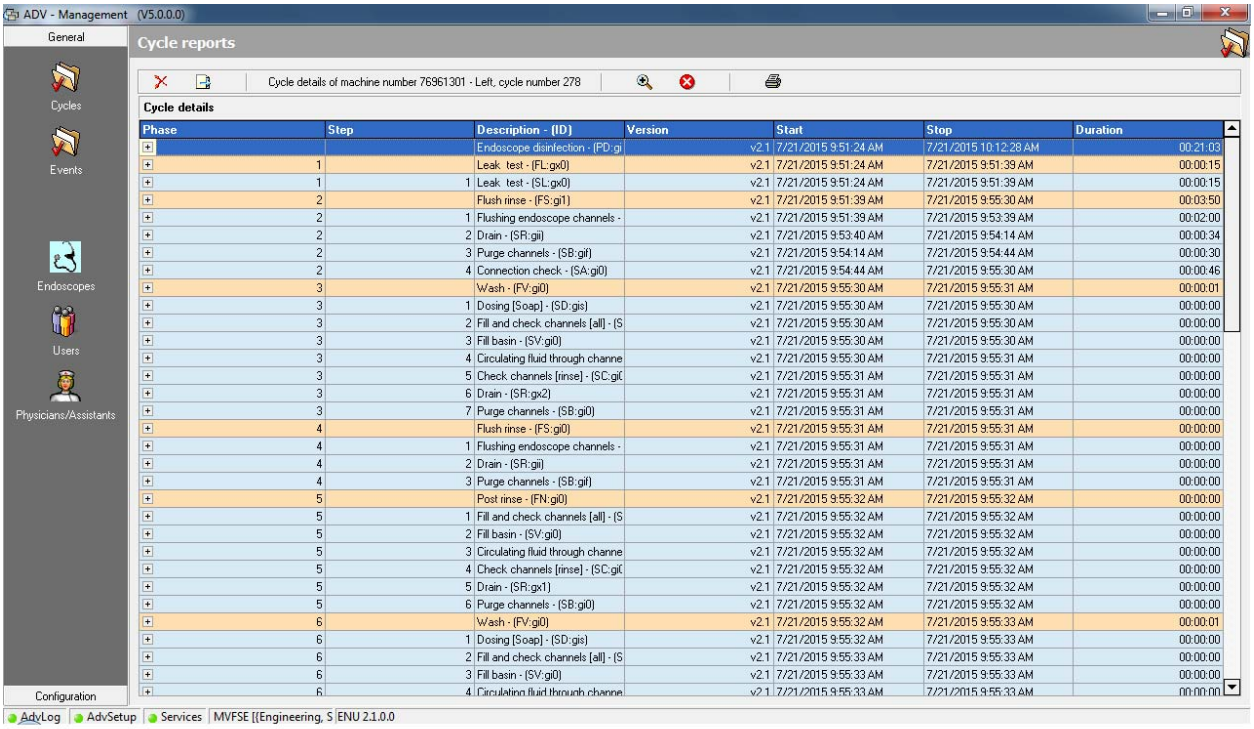


**Figure 76 Run Reports**

The **Detail** button (magnifying glass with plus sign) displays the details for all steps, pressing it again minimizes all details. Press the plus sign to the left of each step to see more information, or press the minus sign to close the step overview. The **Error** button (red circle with white X) will expand the steps to show where the errors have occurred.

### Cycle Summary Report

The cycle summary report can be reached by pressing the Report button (paper with blue arrow). The cycle summary report displays all the details related to the cycle selected. The summary report is what is printed at the end of the cycle.

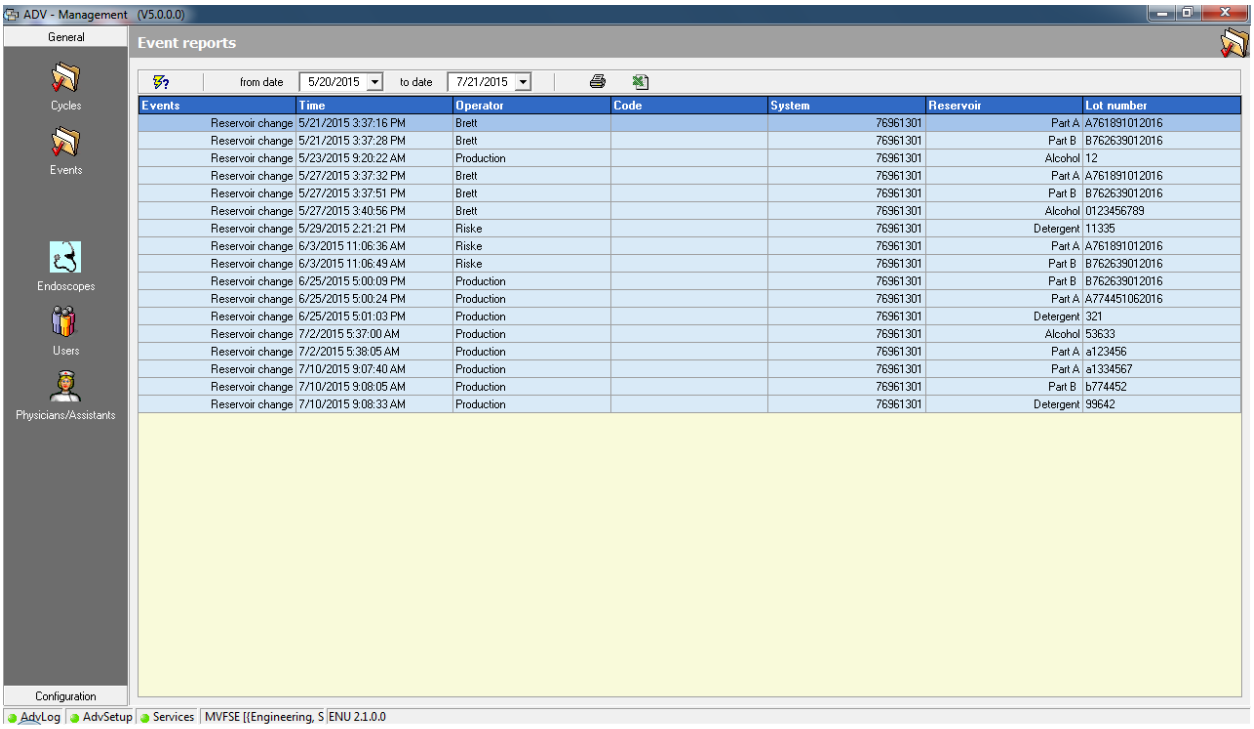
# Events

By clicking on the **Events** icon on the left side of the Management General window, chemistry change data can be called up. For each event, the following data is recorded and stored on the computer hard drive:

- **Events**
- **Time** at which the chemistry was changed.
- **Operator** who changed the chemistry.
- **Code**
- **System** displays the serial number of the reprocessor.
- **Reservoir** describes the type of chemistry changed.
- **Lot number** of the chemistry changed.

To display the events for a certain date range:

1. With buttons "**from date**" and "**to date**" select the dates for your report. Click on the arrow key to the right of each date window.
2. Select the desired start and end dates from the calendars that pop up.
3. Press the **Run** button to run the report.




| Events | Time | Operator | Code | System | Reservoir | Lot number |
|---|---|---|---|---|---|---|
| Reservoir change | 5/21/2015 3:37:16 PM | Brett | | 76961301 | Part A | A761891012016 |
| Reservoir change | 5/21/2015 3:37:28 PM | Brett | | 76961301 | Part B | B762639012016 |
| Reservoir change | 5/23/2015 9:20:22 AM | Production | | 76961301 | Alcohol | 12 |
| Reservoir change | 5/27/2015 3:37:32 PM | Brett | | 76961301 | Part A | A761891012016 |
| Reservoir change | 5/27/2015 3:37:51 PM | Brett | | 76961301 | Part B | B762639012016 |
| Reservoir change | 5/27/2015 3:40:56 PM | Brett | | 76961301 | Alcohol | 0123456789 |
| Reservoir change | 5/29/2015 2:21:21 PM | Riske | | 76961301 | Detergent | 11335 |
| Reservoir change | 6/3/2015 11:06:36 AM | Riske | | 76961301 | Part A | A761891012016 |
| Reservoir change | 6/3/2015 11:06:49 AM | Riske | | 76961301 | Part B | B762639012016 |
| Reservoir change | 6/25/2015 5:00:09 PM | Production | | 76961301 | Part B | B762639012016 |
| Reservoir change | 6/25/2015 5:00:24 PM | Production | | 76961301 | Part A | A774451062016 |
| Reservoir change | 6/25/2015 5:01:03 PM | Production | | 76961301 | Detergent | 321 |
| Reservoir change | 7/2/2015 5:37:00 AM | Production | | 76961301 | Alcohol | 53633 |
| Reservoir change | 7/2/2015 5:38:05 AM | Production | | 76961301 | Part A | a123456 |
| Reservoir change | 7/10/2015 9:07:40 AM | Production | | 76961301 | Part A | a1334567 |
| Reservoir change | 7/10/2015 9:08:05 AM | Production | | 76961301 | Part B | b774452 |
| Reservoir change | 7/10/2015 9:08:33 AM | Production | | 76961301 | Detergent | 99642 |

**Figure 77 Event Report**

# Configuration Tab

## Parameter Sets and Systems

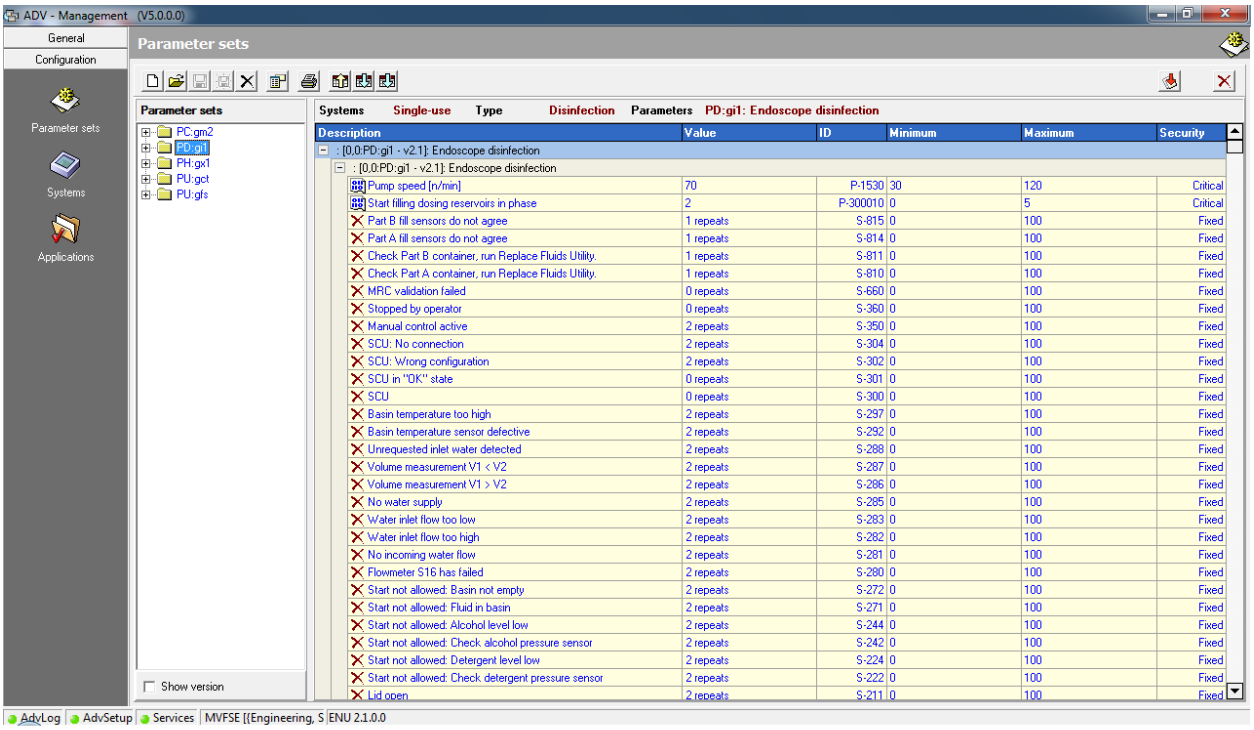

ADV - Management (V5.0.0.0)
General
Configuration
Parameter sets
Systems
Applications
Parameter sets
Parameter sets
PC:gm2
PD:gi1
PH:gx1
PU:gct
PU:gfs
Show version
Systems Single-use Type Disinfection Parameters PD:gi1: Endoscope disinfection
Description Value ID Minimum Maximum Security
: [0,0:PD:gi1 - v2.1]: Endoscope disinfection
: [0,0:PD:gi1 - v2.1]: Endoscope disinfection
Pump speed [n/min] 70 P-1530 30 120 Critical
Start filling dosing reservoirs in phase 2 P-300010 0 5 Critical
Part B fill sensors do not agree 1 repeats S-815 0 100 Fixed
Part A fill sensors do not agree 1 repeats S-814 0 100 Fixed
Check Part B container, run Replace Fluids Utility. 1 repeats S-811 0 100 Fixed
Check Part A container, run Replace Fluids Utility. 1 repeats S-810 0 100 Fixed
MRC validation failed 0 repeats S-660 0 100 Fixed
Stopped by operator 0 repeats S-360 0 100 Fixed
Manual control active 2 repeats S-350 0 100 Fixed
SCU: No connection 2 repeats S-304 0 100 Fixed
SCU: Wrong configuration 2 repeats S-302 0 100 Fixed
SCU in "OK" state 0 repeats S-301 0 100 Fixed
SCU 0 repeats S-300 0 100 Fixed
Basin temperature too high 2 repeats S-297 0 100 Fixed
Basin temperature sensor defective 2 repeats S-292 0 100 Fixed
Unrequested inlet water detected 2 repeats S-288 0 100 Fixed
Volume measurement V1 < V2 2 repeats S-287 0 100 Fixed
Volume measurement V1 > V2 2 repeats S-286 0 100 Fixed
No water supply 2 repeats S-285 0 100 Fixed
Water inlet flow too low 2 repeats S-283 0 100 Fixed
Water inlet flow too high 2 repeats S-282 0 100 Fixed
No incoming water flow 2 repeats S-281 0 100 Fixed
Flowmeter S16 has failed 2 repeats S-280 0 100 Fixed
Start not allowed: Basin not empty 2 repeats S-272 0 100 Fixed
Start not allowed: Fluid in basin 2 repeats S-271 0 100 Fixed
Start not allowed: Alcohol level low 2 repeats S-244 0 100 Fixed
Start not allowed: Check alcohol pressure sensor 2 repeats S-242 0 100 Fixed
Start not allowed: Detergent level low 2 repeats S-224 0 100 Fixed
Start not allowed: Check detergent pressure sensor 2 repeats S-222 0 100 Fixed
Lid open 2 repeats S-211 0 100 Fixed
AdvLog
AdvSetup
Services
MVFSE [(Engineering, S
ENU 2.1.0.0

**Figure 78 Configuration Tab, Parameter Sets and Systems**

# LIO Expert Mode

Expert Mode is a special application of the LIO program. It is used to carry out operations that fall outside the normal use of the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor.

Expert Mode is launched by double clicking on the icon in the upper right of the window. A login window appears and shows the names of the operators who have access rights to the program.

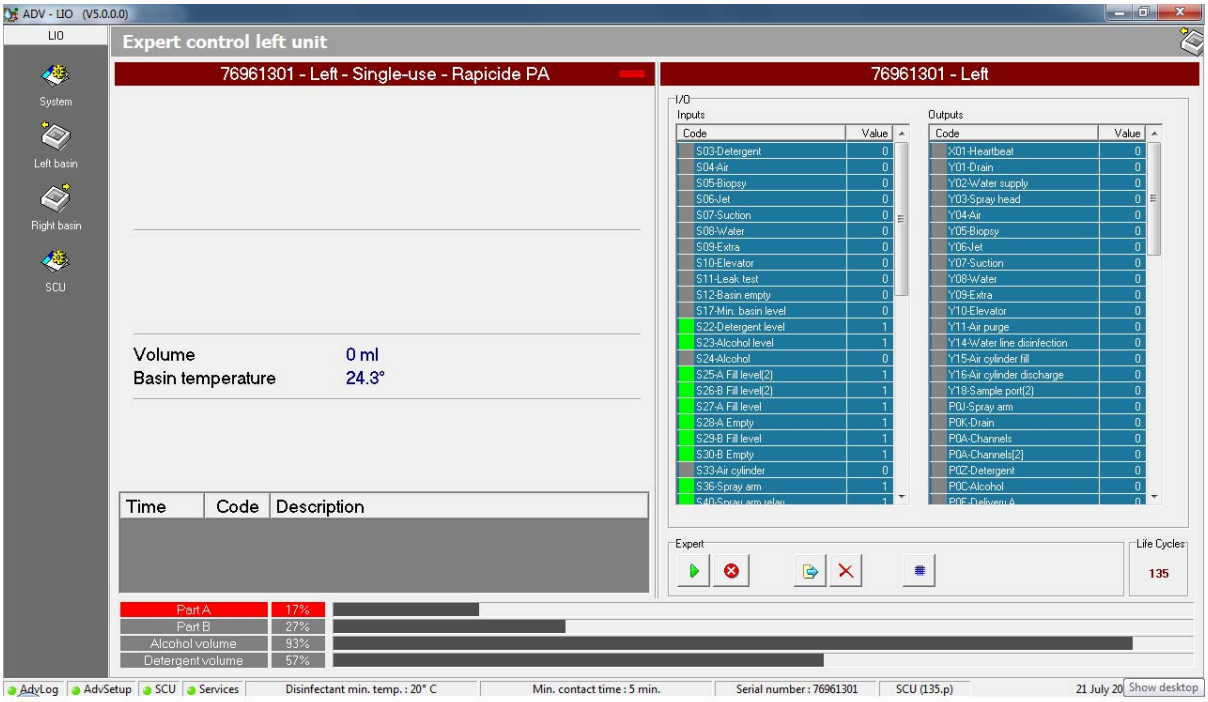



**Figure 79 Expert Mode, Left Basin**

Selecting either the **Left basin** or **Right basin** icons allows that half of the system to be monitored and manually operated. The following controls are available:

- If a sensor sends a signal to an input, the indicator turns green.
- Double clicking on an output allows it to be manually driven and the indicator turns red.
- **Start** is the same as the Start button on the control panel.
- **Stop** is the same as the Stop button on the control panel.
- **Next Step** sends the program to the following step in the process. This is useful when simulating an error report or testing a component after a repair.
- **Abort** cancels the cycle immediately. Use with caution, chemistry may be left in the basin.
- **Release all** must be pressed to undo all manual operations.

## Backups

The computer on the ADVANTAGE PLUS® Pass-Thru Endoscope Reprocessor is equipped with mirrored hard drives. Mirrored hard drives consist of a main hard drive and a second hard drive which contains an exact copy of the first hard drive. This configuration provides a backup of the entire computer system.

The ADVANTAGE PLUS Pass-Thru Endoscope Reprocessor uses MICROSOFT SQL Server 2012 Express to generate the database files. The databases should be backed up on a regular basis. Although the mirrored hard drives do provide protection against a single hard drive failure, regular backups of the database to a remote location (CD, memory stick or remote server) will protect against database corruption or complete system failure. Follow the procedures established by your facility for scheduling and storing backups. Medivators provides a backup utility, SQLBackupAndFTP, preinstalled on the ADVANTAGE PLUS Pass-Thru Automated Endoscope Reprocessor. This utility must be configured. For detailed step-by-step description of the backup process contact Medivators.

## Networking

The ADVANTAGE PLUS Pass-Thru Reprocessor Endoscope Reprocessor is capable of being networked with other ADVANTAGE PLUS Pass-Thru Reprocessor units on a local area network. One computer, either part of an ADVANTAGE PLUS Pass-Thru Reprocessor unit or a separate stand-alone computer may be used as the Server. The other ADVANTAGE PLUS Pass-Thru Reprocessor units are considered Clients of the Server. The Server computer would run the Server and Management applications and contain the ADVANTAGE PLUS Pass-Thru Reprocessor database where all parameters and cycle results are stored. The Clients would run the LIO and Print Service applications. In the way each ADVANTAGE PLUS Pass-Thru Reprocessor unit (Client) could independently initiate and execute the Disinfection, Recovery or Water Line Disinfect programs with the cycle results being printed to its dedicated receipt printer, while all access to management and administrative functions (parameters, users, cycle logs, etc.) would only be possible through the one Server computer.

To create a network of ADVANTAGE PLUS Pass-Thru Reprocessor units, each ADVANTAGE PLUS Pass-Thru Reprocessor unit (Client) and the Server computer must be connected to a hub and assigned a unique IP address. In addition, a unique Workgroup must be created and each Client and the Server computer must be configured to belong to this Workgroup. Once the Workgroup has been established, the appropriate applications of the ADVANTAGE PLUS Pass-Thru Reprocessor computer software can be loaded on each unit, starting with the Server computer. During the install, when asked for the “Server name or server IP-address” each unit should enter the computer name of the Server computer. Finally, each Client should allow the ADVANTAGE PLUS Pass-Thru Reprocessor folder, where the ADVANTAGE PLUS Pass-Thru Reprocessor executable applications reside, to be “shared”. All these changes can be done through the Control Panel of each unit. For detailed step-by-step

description of the network setup process contact Medivators.

# APPENDIX A

## REPROCESSOR SPECIFICATIONS

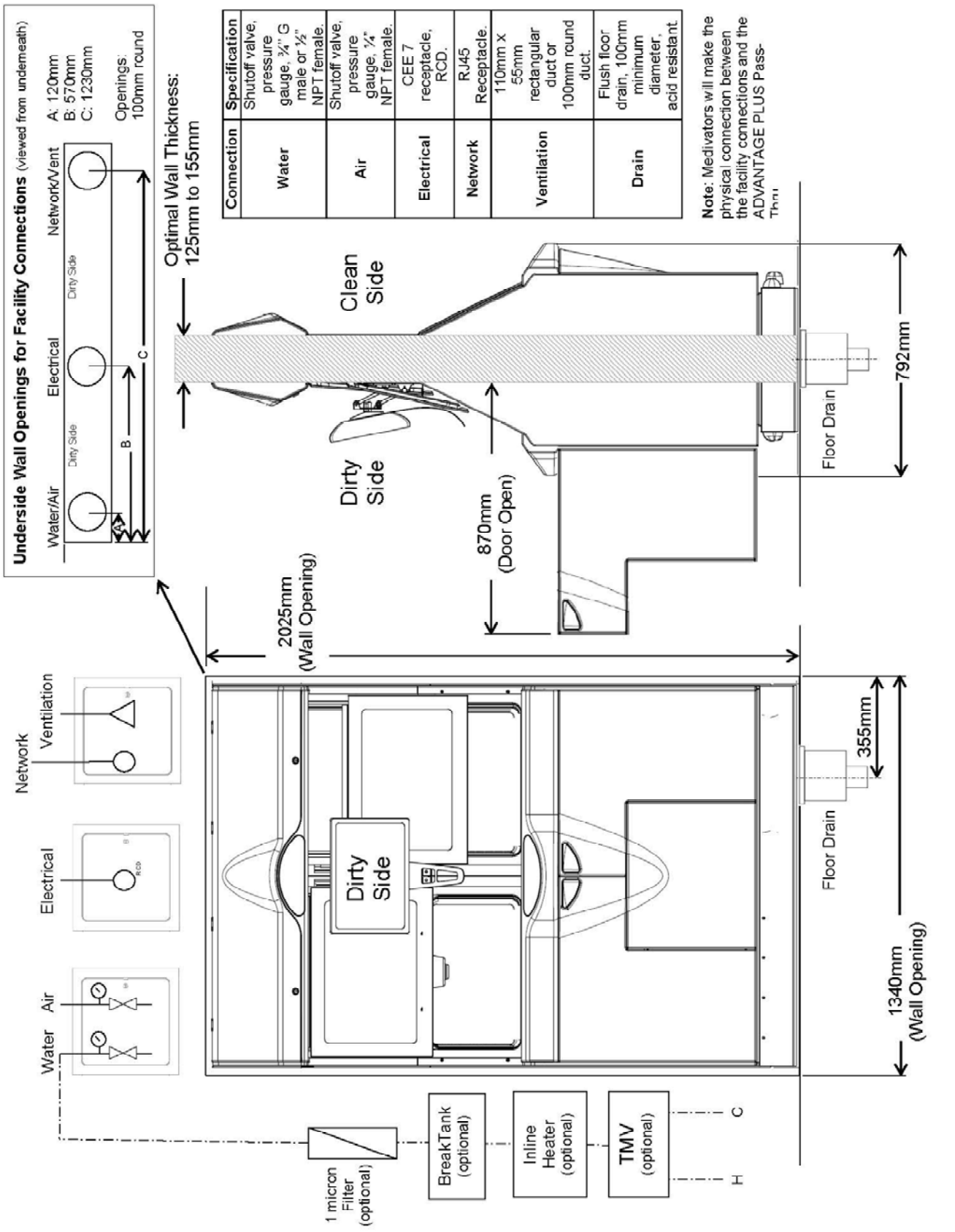
## General Specifications

The basic reprocessor specifications of the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor are summarized in Table 1.

**Table 1 Reprocessor Specifications**

| Equipment Type | Laboratory Equipment |
|---|---|
| Electrical rating | 230 VAC +/-10%, 50 H |
| Power rating | 1800 Watts |
| Air pressure range | 6 - 10 bar |
| Water pressure range | 2 - 6 bar |
| Water flow range | 2 – 8 Liters/minute |
| Water temperature operating range | 20ºC – 40ºC |
| Humidity range for operation | 20–80%, non-condensing |
| Temperature range for operation | 10°C - 27°C |
| Environment | Indoor use only |
| Installation/Over voltage category | II |
| Pollution degree | 2 |
| Connection to power supply | Cord connection |
| Dimensions | 1316mm W x 2000mm H x 792mm D |
| Weight | 400 kg |

# Dimensions and Clearances



## Installation Specifications

The purpose of this section is to provide the customer with requirements that need to be met to ensure the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor will be properly installed.

**Applicable Documents**

- ADVANTAGE PLUS Pass-Thru Reprocessor Endoscope List and Operator ID Form (PN 50092-380)

It is the responsibility of the customer to meet these requirements to ensure proper installation of the ADVANTAGE PLUS Pass-Thru Reprocessor.

The ADVANTAGE PLUS Pass-Thru will be delivered on a pallet along with multiple boxes. It is important to keep all the boxes received with the ADVANTAGE PLUS Pass-Thru Reprocessor together.

It is the responsibility of the customer to provide qualified personnel to provide the connections for the ADVANTAGE PLUS Pass-Thru Reprocessor to the building supply (Water, Electrical, Drain, Air and Network/Internet) during the installation process.

Any deviation from these specifications may cause operational issues that would not be covered by the Warranty.

**Wall Preparation**

- Refer to the included installation diagram.
- Wall opening:
    1. 1 reprocessor: 1340mm wide x 2025mm high
    2. 2 reprocessors: 2655mm wide x 2025mm high
    3. 3 reprocessors: 3970mm wide x 2025mm high
    4. 4 reprocessors: 5285mm wide x 2025mm high
- The wall opening can remain rough, a trim kit will be installed to finish the opening once the ADVANTAGE PLUS Pass-Thru Reprocessor is installed. The trim extends 63mm from the sides and top of the reprocessor.
- The interface between the wall and the floor in the wall opening must not have a cove or fillet.
- Optimal wall thickness is 125mm to 155mm.
- The facility connections are made inside the wall, access panels (facility supplied) will be required to provide access to these connections.
- The facility connections are divided into three groups:
    1. Water and Air
    2. Electrical
    3. Network and Ventilation
- Three access holes in the underside of the wall are required to make the connections between the facility and the ADVANTAGE PLUS Pass-Thru Reprocessor. Access holes need to be free of sharp edges. See the attached installation diagram for the measurements.

**Floor**

- The floor must be level to allow for proper leveling and sealing of the reprocessor.

**IMPORTANT** Do no place the reprocessor on surfaces which could cause a fire or fumes if hot items fall from the reprocessor.

**Water Supply**

- Facility supplied connection, ¾" G male or ½" NPT female with a shutoff valve and pressure gauge located in the wall behind an access panel.
- The incoming waterline must be a minimum of 13 mm ID.
- The supplied water must meet these requirements:
    - Potable water is the minimum standard, RO water is preferred.
    - The incoming water to be filtered to 1 micron.
    - A water pressure of 2 to 6 bar is required, with a minimum dynamic pressure of 2 bar at 5 L/min flow.
    - A minimum flow rate of 5 L/min and.
- Disinfectant water temperature requirements: RAPICIDE PA 30°: 35°C ± 2ºC, RAPICIDE PA 20°: 25°C ± 2ºC, ADASPOR SS: 25°C ± 2ºC
- The water supply must be able to provide an on-demand water temperature to meet the requirements for the disinfectant chemistry used. A thermostatic mixing valve may be needed to supply the required water temperature.
- Water consumption is approximately 30 liters/cycle for a standard endoscope disinfection cycle, 49 liters/cycle for an endoscope disinfection cycle with a detergent wash, and 68 liters/cycle for an endoscope disinfection cycle with two detergent washes. Water consumption for the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor will vary depending on the incoming water temperatures. The reprocessor will extend the initial flush to allow the water to come up to temperature to meet the minimum required temperature of the disinfectant.
- Ensure water hardness is less than 200 PPM CaCO3 (200 mg/L CaCO3) for optimal performance. To meet CFPP 01-06 requirements, water hardness should not exceed 50 ppm CaCO3 (50 mg/L CaCO3) and have a chloride concentration of less than 10 mg/L.
- When using potable water, to comply with EN 1717 a break tank with a type AA or AB air gap needs to be placed in the water supply before the device and its filters.

The MEDIVATORS Endoscope Reprocessors do not require backflow protection for the incoming water supply, nor is a backflow protection device installed in the reprocessor. If building or plumbing codes require backflow protection, then please consult your local codes, standards and/or guidelines, for applicable requirements.

**Drain**

- The drain must be located in the floor in the location indicated in the installation diagram.
- The drain system must be capable of draining 40 L/min.
- Facility supplied connection, a flush floor drain with a minimum diameter of 100mm.

**Air Supply**

- Facility supplied connection ¼" NPT female with a shutoff valve and pressure gauge located in the wall behind an access panel.
- The supplied compressed air must meet these requirements:
    - Air pressure: 4 to 10 bar with a minimum flow volume of 0.71 L/s
    - Filtered to 5 microns
    - Maximum dew point is 7°C
    - Maximum oil concentration is 5 mg/m3.
- Air usage is approximately 65 liters per cycle.

**Electrical Supply**

- 230 VAC ± 10%, single phase, 60 Hz, 1800 watts
- Facility supplied connection, a RCD protected CEE 7 outlet located in the wall behind an access panel.
- For other country specific electrical requirements contact Medivators.
- Power consumption: 270 watts at idle, 720 watts during a cycle in one basin, 1080 watts during a cycle in both basins, and a nominal peak of 1800 watts.

**Heat Load**

- Idle: 900 BTU/hr
- Cycle (1 basin): 2400 BTU/hr
- Cycle (2 basins): 3600 BTU/hr

**Ventilation**

It is the customer's responsibility to ensure the room is in compliance with this requirement. This is not a requirement of the ADVANTAGE PLUS® Pass-Thru Automated Endoscope Reprocessor but of the chemicals that are used for disinfection.

- It is a health and safety requirement to have a minimum of 10 air changes per hour in the room. During cycle operation and the chemical heating process, chemical vapor may be produced. The air exchange will minimize staff exposure to chemical vapors.
- Facility supplied connection, a 110mm x 55mm duct or 100 mm round duct located in the wall behind an access panel.
    - A minimum of 12 L/s at 62 PA static pressure is required to properly vent the ADVANTAGE PLUS Pass-Thru Reprocessor.

**Network**

- Facility supplied connection, RJ45 receptacle located in the wall behind an access panel.
- The ADVANTAGE PLUS Pass-Thru Reprocessor is equipped with a computer running Windows 7 which will allow full networking along with the capability of remote diagnostics.
- To allow for remote diagnostics an internet connection is required. This is highly recommended.

**Dimensions**

- The physical dimensions are 1316mm Wide x 2000mm High x 792mm Deep.
- The weight is 400 kgs.

**Endoscope & User Information**

- To ensure a smooth and trouble-free installation, the customer must supply a complete list of users and endoscopes that will be reprocessed in the ADVANTAGE PLUS® Pass-Thru Reprocessor.
- Fill out the ADVANTAGE Endoscope List & Operator ID form (PN 50092-380).

If all specifications are met, the site is suitable for the installation and use of the ADVANTAGE PLUS Pass-Thru Automated Endoscope Reprocessor.

# APPENDIX B

## REPLACEMENT PART NUMBERS

## REPLACEMENT PART NUMBERS

| Description | Order # |
|---|---|
| Accessory Bags | CB12-0002 |
| Air Filter (Pkg. 8) | MF01-0028 |
| Basin Drain Filter (Pkg. 12) | MF01-0059 |
| Basin Drain Filter Hook (ea.) | 5-6-170 |
| Barcode Tags (100-199) | 67199-157 |
| Barcode Tags (200-299) | 67199-158 |
| Barcode Tags (300-399) | 67199-541 |
| Barcode Tags (400-499) | 67199-660 |
| Disinfection block (ea.) | 78401-444 |
| Water Pre-Filter 0.4 Micron Nominal | MF01-0071 |
| Water Filter 0.2 Micron Absolute Bacterial Retentive (Pkg. 2) | MF01-0084 |
| Sampling Cups | ML02-0121 |
| Silicone Oil | 17599-496 |

# APPENDIX C

## WARRANTY

## NEW PRODUCT WARRANTY

### Limited Warranty

Subject to the terms below, Medivators Inc. (the “Company”) warrants that its products (the “Products”) will conform to the Company’s written specifications (where applicable) and will be free from defects in material and workmanship under normal use and service for the following periods (the “Warranty Period”):

Endoscope reprocessors and associated equipment, and Irrigation Pumps: fifteen (15) months from date of shipment from the Company or one (1) year from the date of installation, whichever occurs first.

Consumables, accessories, and Product service parts, including, but not limited to, endoscope hookups, filters, printers, printer supplies, test strips, accessory bags, and service parts for products: ninety (90) days from the date of installation or one hundred and twenty (120) days from the date of shipment, whichever occurs first.

Disposable Products: warranted for single use. The Warranty Period will not in any case exceed the expiration date on the Product label.

The warranty does not cover, and the Company will have no warranty obligation whatsoever with respect to, any damage to a Product caused by or associated with: (i) external causes, including without limitation, accident, vandalism, acts-of-God, power failure or electric power surges, (ii) abuse, misuse or neglect of the Product by the customer or use of unauthorized third party filters or other consumables and accessories, (iii) usage not in accordance with product instructions, (iv) the customer’s failure to perform required preventive maintenance, or (v) servicing or repair not authorized by the Company.

### Limitation of Remedy

The warranty obligation of the Company hereunder is limited to (at its option) (i) the repair or replacement of the defective Products or any parts it deems defective, or (ii) a refund of the purchase price. This will be customer’s exclusive remedy for a covered defect.

In order to recover under the warranty, the customer must notify the Company in the state (if in the U.S.A.) or the country of installation, of the defect (describing the problem in reasonable detail) prior to the expiration of the Warranty Period and within thirty (30) days of discovery of the defect. Upon receiving the Company’s official “Returned Material Authorization” (RMA), the customer must promptly return the defective part or Product to the Company (or the service center indicated on the RMA), freight and insurance prepaid. The Company will not be responsible for any damage during shipment.

### Warranty Disclaimer

THE WARRANTY ABOVE IS THE COMPANY’S ENTIRE WARRANTY OBLIGATION TO THE PURCHASER OF PRODUCTS. IT IS IN LIEU OF ALL OTHER WARRANTIES OF THE COMPANY, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND THE COMPANY

DOES NOT REPRESENT OR WARRANT THAT ANY PRODUCT WILL MEET

CUSTOMER'S REQUIREMENTS. THE COMPANY'S RESPONSIBILITY FOR DEFECTS IN A PRODUCT IS LIMITED SOLELY TO REPAIR, REPLACEMENT OR REFUND OF THE PURCHASE PRICE AS SET FORTH IN THIS WARRANTY STATEMENT.

TO THE EXTENT PERMITTED BY LAW, THE COMPANY SHALL NOT, UNDER ANY CIRCUMSTANCES, BE LIABLE TO CUSTOMER FOR CONSEQUENTIAL, INCIDENTAL, INDIRECT, PUNITIVE OR SPECIAL DAMAGES OR LOSSES, INCLUDING WITHOUT LIMITATION, DAMAGES ARISING OUT OF OR IN CONNECTION WITH ANY MALFUNCTIONS, DELAYS, LOSS OF PROFIT, INTERRUPTION OF SERVICE, OR LOSS OF BUSINESS OR ANTICIPATORY PROFITS, EVEN IF THE COMPANY HAS BEEN APPRISED OF THE LIKELIHOOD OF SUCH DAMAGES OCCURRING.

This Warranty gives the customer of Products specific legal rights, and customers may also have other rights which vary from jurisdiction to jurisdiction.

In no event shall the Company's liability exceed the original purchase price of the covered Product.

No representative or agent of the Company has any authority to bind the Company to any other representation or warranty with respect to the Products, and the customer accepts the Products subject to all of the terms above.

MEDIVATORS
A Cantel Medical Company

Manufactured in the USA by:

CE 0050

Medivators Inc.
14605 28th Avenue North
Minneapolis, MN 55447 USA
Toll Free: +1.800.444.4729

EC REP

Medivators BV
Sourethweg 11
6422PC Heerlen
The Netherlands
Tel: +31.45.5.471.471

Cantel Medical Asia/Pacific Pte. Ltd.
1A International Business Park
#05-01 Singapore 609933
Tel: +65.6227.9698

Cantel Medical Devices (China) Co. Ltd.
Unit 804-805, Innov Tower Block A,
Hongmei Road, Xuhui 200233 Shanghai
Tel: +86 21 60161380
Fax: +86 21 61210913

www.medivators.com